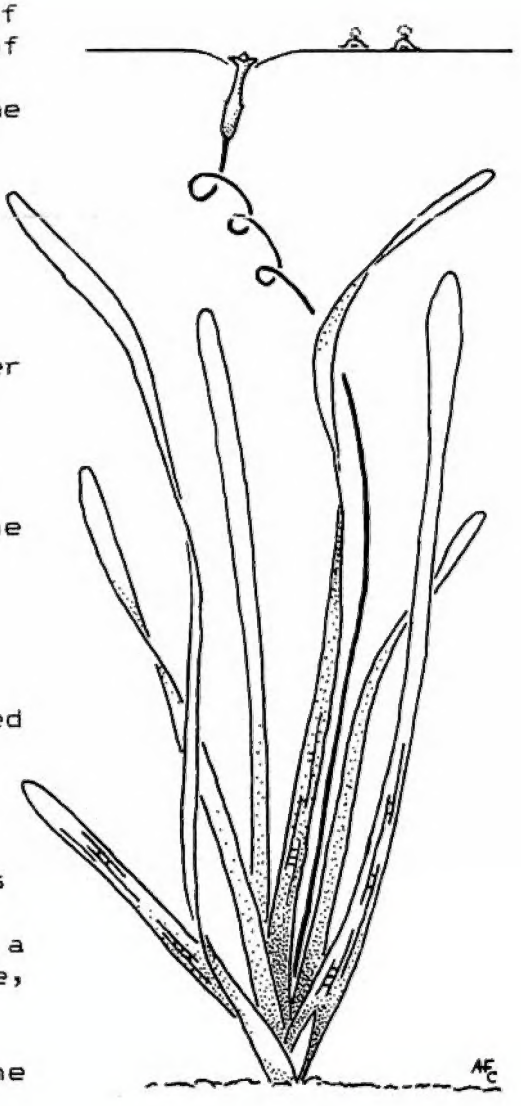
MINNESOTA PLANT PRESS

Vol.8:1 NEWSLETTER OF THE MINNESOTA NATIVE PLANT SOCIETY Fall 88/89

FALL FLOWERING AQUATICS -- *Vallisneria americana*

Now that another Minnesota winter is close at hand, our botanizing activities begin to slow down. Fruits are often still to be seen and can sometimes present a challenge in identification of their producers, but plant hunting at this time of the year often is not extensive. Yet, there are flowers to be seen; members of the Asteraceae come readily to mind. Another plant still flowering but often overlooked is eelgrass (a.k.a. tapegrass, water celery).



Eelgrass, *Vallisneria americana*, is a submerged plant of quiet waters or slow streams where there is a muddy substrate. The genus is worldwide in distribution, though mainly in warmer waters, and is highly prized by aquarists as a natural oxygenator for fish tanks. The ribbon-like leaves may grow to two meters in length but less than a centimeter in width. Flowering, in Minnesota, occurs in August and September with the latest recorded flowering time of 26 September (probably reflects a lack of botanists in the field in the fall). The plants are dioecious (sexes are on different plants) with very inconspicuous flowers: three sepals and three white petals; the female flowers have three united carpels; the male flowers generally have two stamens. Initially developing underwater, the flowers rise to the surface just before opening.

The most interesting aspect of this plant is its mode of pollination. Each female flower is borne on a stalk (peduncle) that grows upward in a spiral fashion bringing the flower to the surface, where it sits in a little "dimple." The male flowers, however, are released by their inflorescence to rise to the surface. Once at the surface the perianth opens and forms a little

"upside-down canoe" supporting the stamens. Water and wind currents then blow the little male flowers around; as they approach a female flower, water tension causes an acceleration and the male flowers slide down the sides of the "dimple" and slam into the female flower. Bingo! Pollination! Once pollination occurs, the stalk of the female flower then begins contracting, pulling the ovary into the water where fruit maturation will take place. Population increase, however, is probably due more to vegetative reproduction (the plants are stoloniferous); the protein-rich male flowers are often eaten by various fish.

--- Nita Cholewa

(This pollination syndrome is described in greater detail in Meeuse & Morris, "The sex life of flowers," 1984, and in Wylie, Botanical Gazette 63:135-145, 1917.)

MNPS NEWS **

Upcoming meetings

The general topic for our programs this year is to be the following:

Some Ecological Factors as They Affect Minnesota Plants.

For the first meeting on **Wednesday, 5 October**, we are pleased to have as our guest speaker, **Dr. Ed Cushing**, professor in the Dept. of Ecology and Behavioral Biology at the University of Minnesota. His topic will be:

Soils as a Factor Affecting Plant Distribution in Minnesota.

Following the program will be the annual seed exchange and a social period.

--- May Wright

General meetings are held the first Wednesday of each month **(5 Oct, 9 Nov, 7 Dec)**, in **335 Borlaug Hall, UM St. Paul campus.** Meetings start at **7:30 pm** and are open to the public.

Board meetings are held in the St. Paul Student Center Cafeteria, at 5:30 pm, on the same evenings as the general program. Board meetings are open to all MNPS members.

Annual Seed Exchange - 5 October

The annual exchange of seeds of native plants will be held as part of the **October meeting.** At the seed exchange, envelopes of seeds will be available to those attending the meeting, but contributors will be given first selection.

To prepare for the exchange, please collect only mature seeds that are free of insects and disease. Take only a small percentage of seed of wild plants. Label seed envelopes with name of plant, collection site, habitat, date of collection and your name. Please also indicate if the seeds are from a garden or a wild plant.

Please bring seeds to the meeting **by 7:15 pm.** If you cannot attend the exchange but have seeds to donate, please send them to: Dr. May Wright , **by 28 September.**

--- Chris Soutter

Lawsuit Settlement

Two years ago, a libel lawsuit was brought against MNPS by Tony Tonga of Nerstrand Woods State Park. The lawsuit was initiated because of our response to the destruction of a population of Erythronium propullans in the State Park. Early this summer the lawsuit was settled, by Court Dismissal. We extend our deepest gratitude to our lawyer, Stephen S. Eckman.

Although Mr. Eckman donated much of his time on this case, we still have some legal costs to pay. Our remaining balance is approximately $3000; we hope to generate the money through donations and fund-raisers this year. As you renew your membership, please consider making a donation to the legal fund to help pay for these costs.

MNPS Committees Need Volunteers

Standing committees are an integral part of our Society. If you would like to help, in any way for as much time as your schedule allows, please consider contacting the appropriate chairman (see below). Last year's questionaire indicated much support. Let's see it happen . . .

Education & lectures (includes helping arrange speakers) . . . . . May Wright
Publicity & welcoming (includes arranging refreshments) . . . . . Robin Fox
Workshops & field trips . . . . . Robin Fox
Membership . . . . . Pat Leacock
Historian & records . . . . . Chris Soutter
Conservation . . . . . Harriet Mason
Newsletter . . . . . Nita Cholewa

Proposed changes to our bylaws

During the past year, the Board has made several proposed changes to the MNPS bylaws, primarily to clarify some issues but also to reflect our Society's growth. In order for these changes to become effective two consecutive monthly ballots, regarding acceptance/rejection of the proposed amendments, are required. Voting will be by secret ballot at the October and November meetings. The following list indicates the proposed changes ("prev." indicates what the bylaws currently say; "prop." indicates suggested change):

Art. III - Membership
Sect.A - prev.: Specific dues listed for each membership category. prop.: Omit specific amounts of dues.

Sect.A #3 - prev.: "Student. **Under age 30 and** attends a school full time ..." prop.: "Student. Attends a school full time ..."

Sect.A #4 - prev.: "Senior. Over age 62 **and** retired ... prop.: "Senior. Over age 62 **or** retired ..."

Sect.A #6 - prev.: "Donor. Those individuals or organizations who make a gift, devise or memorial of $25.00 or more. Entitled to newsletter, does not include voting rights or privileges of holding office." prop.: Delete "Entitled to ... holding office" and add "Same priveleges as Individual."

Sect.B - prev.: "Dues are payable upon application for membership and annually on the 1st of **September**." prop.: "... on the 1st of **October** ..."

Sect.H - prev.: "Dues shall be one-half for persons applying for membership after January 1st." prop.: "... applying for **new** membership ..." Add "New members joining after April 1st shall be considered paid through September of the following year."

Art. IV - Meetings

Sect.A - prev.: "Monthly meetings of the membership shall be held on the first Wednesday of each month, October through **June**, ..." prop.: "... October through **May**, ..."

Sect.D Sent.3 - prev.: "The Treasurer shall prepare and give an annual accounting of the corporation's receipts and expenditures." prop.: **add** "which shall be published in the next newsletter."

Sect.F - prev.: "An identified absentee ballot may be cast by mail." prop.: **add** "An absentee ballot may be obtained from the secretary and must be returned to the secretary before the election."

Art. V - Board of Directors

Sect.F - prev.: "... propose a slate of three new Directors in time for notice of the proposed slate to appear in the January issue of the Minnesota Plant Press." prop.: "... to appear in the January **(winter)** issue ..."

Art. IX - Newsletter

prev.: "The Minnesota Plant Press newsletter shall be published in September, January, and May ..." prop.: "... published in September **(fall)**, January **(winter)**, and May **(spring)** ..."

1988 MINNESOTA BOTANY EXHIBITION ****

Time once again for the annual Minnesota Botany Exhibition of International Photography, sponsored jointly be MNPS and Minnesota Nature Photography Club, and approved and listed by the Photographic Society of America. This year's MNPS showing will be narrated by Rick Haug of MNPC and Nita Cholea and Dave McLaughlin of MNPS.

Subject matter is restricted to BOTANY and its many facets: flowering plants, non-flowering plants (fungi, lichens, mosses, ferns), habitats, and fossil plant life. The photography should be done in such a fashion that a well-informed person will be able to identify the subject material and to certify to its honest presentation. Human elements, if present, should be unobtrusive and enhance the nature story. Photographs that depict artificially produced hybrid or horticultural varieties of plants many not be used. Photographs depicting still life studies, obviously set flower arrangements, mounted specimens, museum habitats or groups, derivations or any form of photographic manipulation that alters truth of the photographic statement are ineligible and shouLD not be submitted. Exception: detailed micro or macrophotography. Entries restricted to 2 x 2 slides. **ALL SLIDES MUST BE SPOTTED IN THE LOWER LEFT-HAND CORNER AS VIEWED FROM AN UPRIGHT POSITION AND MUST BEAR THE NAME AND ADDRESS OF THE MAKER.** DESCRIPTIVE TITLES ARE RECOMMENDED.

This exhibit will follow the recommended procedures of PSA and is open to everyone, everywhere. All possible care will be taken to protect slides, however, responsibility cannot be assumed for lost or damaged entries. Entries without proper entry fee ($3.50) will not be returned or forwarded. All Acceptances will be eligible for listing in PSA's "Who's Who" and will count toward "Star Ratings."

JOIN PSA !

THE PHOTOGRAPHIC SOCIETY of AMERICA
3000 United Founders Blvd, Suite 103
Oklahoma City, OK 73112 USA

1988 ENTRY FORM
MINNESOTA BOTANY

Entry No. _____ Ck ____ RC ____ C ____

Name _____ Honors _____

Street _____

City _____ State _____ Country/Zip _____ Star Rating ____

OVERSEAS ENTRANTS: Underline family Name
Familiennname unterstreichen. Prenom et nom. Souligner le nom.

	TITLE Please print or type	Score	Award
1			
2			
3			
4			

Entry forwarded from _____ Forward to (enclose label)

ENTRY FEE: 4 Slides $3.50 **Make checks payable to MINNESOTA BOTANY EXHIBITION**

TO:

MINNESOTA BOTANY EXHIBITION
Richard Haug, CHMN
2514 Pennsylvania Ave.
Minneapolis, Minn. 55426 USA

Photographs for Exhibition to be returned to sender

NO COMMERCIAL VALUE

FIRST CLASS MAIL

MINNESOTA BOTANY
Richard Haug, CHMN
2514 Pennsylvania Ave.
Minneapolis, Minn.
55426 USA

.....

Photgraphs from Exhibition being returned to sender. NO COMMERCIAL VALUE

REPORT CARD

MINNESOTA BOTANY
Richard Haug, CHMN
2514 Pennsylvania Ave
Minneapolis, Minn.
55426 USA

CATALOGUE

Kenneth Olson FPSA
MN Botany Catalog CHMN
3 Woodhill Lane
St. Paul MN 55127 USA

NEXT ENTRY FORM

Eighteen medals to be awarded this year for: PSA Best of Show; Best slide by an exhibitor outside of USA; Best non-flowering plant; Best terrestrial orchid; 3 medals to the Best slide of 3 Minnesota residents; 11 medals - open category.

Calendar:

Closing deadline for entries	3 Oct
Judging	8 Oct
Report cards mailed	12 Oct
Total rejects mailed	18 Oct
All slides returned	17 Nov
Catalogues mailed	26 Nov

Showings:

7:30pm - 2 Nov, Borlaug Hall, UM St.P.
7:00pm - 14 Nov, Central Community Center, St. Louis Park

For more information, contact Rick Haug, (evenings).

1988 INVASIVE WEED SYMPOSIUM A SUCCESS ****

Through the generosity of the Belwin Outdoor Education Laboratory, the MNPS held its first symposium, "Plant Invaders," in Afton on 9 April 1988. Approximately 85 people, including many associated with regional parks and nature centers, gathered in the Belwin meeting room to hear three well-illustrated presentations from experts on plant invaders. Virginia Kline, Professor of Botany, Univ. of Wisconsin-Madison Arboretum, spoke on European buckthorn and hybrid honeysuckles. Calvin Messersmith, Professor of Agronomy, Univ. of North Dakota, Fargo, discussed leafy spurge. Bonnie Harper from Minn. DOT and Jay Rendall from Minn. DNR shared the platform to present the case against purple loosestrife. The following is a summary of their presentations.

European, or common, buckthorn (Rhamnus cartartica), leafy spurge (Euphorbia esula), and purple loosestrife (Lythrum salicaria - including the cultivated "Morden Pink") are major threats to the native vegetation of Minnesota. They share a common Eurasian origin, and they all were introduced to North America without the biological control agents that keep each in check in its native habitat. All of these weeds might be controlled someday by the introduction of natural predators, such as insects or fungal or other diseases, but at present no control agent is sufficiently well studied to be used with any of them. Each of these invasive plants occurs in a different habitat, although buckthorn and loosestrife may occur together in wetlands.

Buckthorn -- a shrub to small tree native to open oak woods, thickets and floodplains. The male flowers are produced on separate plants from the female; if only male plants were sold, it would help limit their spread. In North America seedlings are generally most successful in wetlands and oak woods, but at the Wisconsin Arboretum buckthorn and honeysuckle are major weeds in all ecosystems except prairie. Birds eat the fruits and are the major dispersal agents. The fruits are also eaten by other animals, such as mice and elk, and they can float for several days without losing viability. A second related species of buckthorn (alder-buckthorn, R. frangula) is also becoming a problem in wetlands.

Leafy spurge -- an herbaceous plant several feet tall that can be identified by the yellow bracts and by a white latex in the sap. It is adapted to cool regions and is a major threat on grasslands of the northern Great Plains. Seventy percent of the dry weight of vegetation in some infested areas is leafy spurge. It is avoided by cattle and ruins grazing lands. Its seeds are spread by birds and other wildlife but, in addition, the capsules open explosively, throwing seeds up to 15 feet away. Leafy spruge has very deep roots, to 30 feet, and produces new shoots from buds on horizontal rhizomes. Its ability to regenerate and its deep roots make it particularly difficult to control.

Purple loosestrife -- is a handsome herb two to seven feet tall. It has pubescent leaves, which may aid in its identification, but it is easily confused with native lythrums. It is best not to plant any lythrums from nurseries. Purple loosestrife seeds are dispersed by floodwaters, waterfowl and other animals, and by boats. Eight natural plant communities in Minnesota are affected by it, including sand beaches, marshes, sedge meadows, calcareous fens, and wet

blacksoil prairies. Habitats for many animals, such as northern pike, loons and ducks, are adversely affected by purple loosestrife because it outcompetes native plants. Undisturbed wetlands are unlikely to be invaded but beware - drought leads to outbreaks as low water opens previously submerged land to colonization.

Control -- The most effective means of control for all of these plant invaders is the selective use of herbicides. Other methods, such as digging, burning, or flooding wetlands, fail for a variety of reasons. Cutting buckthorn shrubs in the fall and treating stumps with a higher concentration of "Roundup" (20%) than is recommended on the label has worked well. The number of native plants at the Univ. of Wisconsin Arboretum increased 3-10-fold in 1-2 years after control began. For leafy spruge "Tordon" is recommended. It is necessary to spray 15 feet around an infestation to get at the roots and dispersed seeds. [Editor's note: It is best to check with your County Extension Agent before using any herbicide. Side effects to the environment are not always listed on the package] Although leafy spurge can be controlled, eliminating it is unlikely. Purple loosestrife infestations should be reported to the DNR. "Rodeo" will eliminate mature plants but does not control seedlings. A permit (available free from the DNR) is necessary to apply "Rodeo." MNPS members should get further details on control methods before trying them because a number of additional herbicides may be more suitable in particular situations.

MNPS members can assist in controlling these invasive plants in several ways. Alert your neighbors to the dangers of planting some horticultural plants. If only male buckthorns were planted or if female plants were removed, the buckthorn problem would be greatly reduced. Weeding uncultivated or natural areas to remove young buckthorns is effective. New infestations of purple loosestrife should be reported to your local office of the DNR (or Jay Rendall, 612-296-2835). One plant per acre is a major purple loosestrife infestation because of the high seed production. Leafy spurge, if sprayed when the population is small, can be kept under control.

In addition to the guest speakers, several elegant displays on these invaders were set up to acquaint the audience with the plants. David Biesboer and Willard Koukkari, professors of Botany, Univ. of Minnesota, St. Paul, explained their research on leafy spurge; Jay Rendall had a display on the DNR's control program for purple loosestrife; specimens from the Univ. of Minnesota Herbarium and live plants were also available for examination.

MNPS is grateful to our speakers, two of whom made long trips to share their knowledge of these plants with us; to the Belwin staff for helping us get set-up; to Esther McLaughlin for coordinating the symposium; to Vera Wong for designing the brochure; and to the many members and students who assisted in making the symposium a success. We will be soon be asking for help with this year's (1989) symposium; it is a great way to get acquainted with members of the Society.

--- Dave McLaughlin

A final thought from Virginia Kline: there should be a tax on horticultural introductions with the funds dedicated to fighting the problems caused by ornamental invaders.

1988 SUMMER CAMPOUT SPECTACULAR ****

The first annual MNPS campout was held the weekend of 24-26 June at the Engels' farm in Aitkin County of central Minnesota. Those who couldn't come missed a great time!

Friday evening was spent setting up tents, relaxing, getting acquainted and trying to cool off. Saturday brought a perfect day with a refreshing breeze to keep away the deer flies and cooler temperatures. After an outdoor breakfast we headed for the Long Lake Conservation Center, located south of Palisade. (The Center annually provides several thousand school children the opportunity to study the environment, learn about conservation, and gain an appreciation of their natural surroundings.)

Our morning hike was through a northern hardwood forest with maple, basswood, and oak. The path went past alder thickets and a small "kettle," which had fertile rattlesnake ferns, Botrychium virginianum. Although most of the forest flowers were past, Dave McLaughlin (mycologist, UM) was pleased to find that the rain of a week before had induced a number of fungi to fruit. We found an interesting variety of mushrooms and a very colorful slime mold.

Lunch was eaten on the shore of Long Lake and then it was off into a tamarack-black spruce bog. Here again, most of the plants were past the flowering stage but we learned to identify various ericaceous plants by their fruits, e.g., Ledum, Kalmia, Vaccinium, Andromeda, and Chamaedaphne. The cranberry, Vaccinium oxycoccus, was the only one still flowering. There were also several kinds of unique fungi nestled in the sphagnum. Although the area had been parched by the summer drought we stood in ankle deep water on the 15 sq.mi. bog, while enjoying the fragrance of Labrador tea, Ledum groenlandicum, and listening to the song of a white throat. As far as we could see there were black spruce and tamarack with open areas of sphagnum decorated with white dots of cotton grass, Eriophorum.

Next, we explored the lake shore and its band of floating sedge mat, a new experience for some. This proved to be the most productive in terms of flowering plants. Welby Smith (botanist, DNR) helped to identify the plants and he also found the not-so-obvious tiny Drosera intermedia, a sundew with elongate leaves. Also of interest were several sedges, marsh cinquefoil - Potentilla palustris, swamp candle Lysimachia terrestris, pitcher plant - Sarracenia purpurea, and a bladderwort Utricularia. We were also pleased to find two lovely pink orchids, Calopogon pulchellus and Pogonia ophioglossoides. In the water were species of Polygonum, Nymphaea, Brasenia, Sagittaria, and Sparganium.

One couple took time for a cool dip in the lake and then we all went back to the farm for an outdoor dinner. Another hike in the evening along the Mississippi River took full advantage of an unusual Minnesota summer without mosquitos. Because of the drought the river had a wide mud bank, upon which many annuals, not normally seen, were growing. Of interest were several species of Scrophulariaceae. One with tiny lavender flowers and forming low mats was Lindernia dubia; taller plants were the monkey flower, Mimulus ringens; and a tiny

white-flowered speedwell, Veronica peregrina. There were numerous plants with arcs of yellow-green flowers, the ditch stonecrop, Penthorum sedoides, as well as silver-leaved everlasting, Gnaphalium obtusifolium.

After exploring the riverbank we returned once more to the farmhouse and spent some time looking at a display of fungi collected on the day's hikes and identified by Dave McLaughlin. There were many families represented, a pleasant surprise for such a dry summer. Not willing to end the busy day, Audrey Engels and Dave McLaughlin also presented a slide show that included flowering bog plants, a review of other plants seen that day, Minnesota orchids, and some of the fungi one would expect to see in the habitats we had visited.

Everyone headed home early on Sunday, but agreed it was a successful weekend and wished to make it an annual event. Hosted by John and Audrey Engels, the group included Dave and Esther McLaughlin, Welby Smith, Vera Wong, Nick Rowse, and Mary Anne and Brad Beisel.

--- Audrey Engels

1988 Summer Campout: Nick, Vera, Welby, Brad, and Mary Anne look on as Dave explains about an unusual mushroom.

UM DEPT. OF BOTANY REORGANIZATION ****

Thanks to our members and friends who took the time to make legislative contact in support of the Dept. of Botany (legislators received an overwhelming amount of letters).

The Dept. apparently will not be disbanded as the new dean had suggested. Instead, a reorganization is now underway that may broaden the scope and improve the quality of the Department, which will also be renamed the Dept. of Plant Biology. The plans now call for the Department to be answerable to the colleges of Biological Sciences and Agriculture. Existing botany staff may be augmented by additions from other departments (e.g., Dept. of Genetics and Cell Biology and Dept. of Horticultural Science). Administrative details still need to be hammered out but the prospects seem encouraging.

While cautious optimism is probably the appropriate mood, continuing vigilance will be necessary to insure that courses and research in whole organisms and their classification, anatomy, diversity, evolution, etc. remain at the center of the Deaprtment's mission. We will keep the membership informed as this reorganization takes shape. Thank you again for your support!

--- Nita Cholewa, Dave & Esther McLaughlin

CONSERVATION CORNER ****

1988 Minnesota Environmental Congress -- State environmental officials will travel to five MN cities in September and October to discuss environmentl issues with interested citizens. Groundwater pollution, air pollution, protecting human health, protecting wildlife habitat, water protection plans, and financing environmental protection are some of the issues to be addressed. The Congress, sponsored by the MN Environmental Quality Board, is open to the public. Information gathered from these meetings will be compiled into a report for the Governor and the Legislature.

For more information about the Environmental Congress or to pre-register, contact the MN Environmental Quality Board, 300 Centennial Office Building, 658 Cedar St., St. Paul, MN 55155, or call 612-296-2603. Individuals who pre-register will receive background materials prior to the sessions.

--- Sheldon Mains

GARDENER'S CORNER ****

New England Wildflower Society 1989 Seed List

The New England Wild Flower Society is again offering for sale more than 150 varieties of wildflowers and ferns, adapted to a wide range of locations. All requests for the 1989 Seed List must be received by 1 March because seed sales close 15 March. Send a self-addressed, $.45-stamped envelope (#10, business size) to: Seeds, New England Wild Flower Society, Hemenway Rd, Framingham, MA 01701. **No requests for lists will be honored without the stamped envelope.** Requests will be filled in the order received.

References and Nurseries for Minnesota Flora

The following information is often requested and here provided for your benefit. I have compiled these lists from my own experience and have tried to keep them restricted to the Minnesota area.

---- May Wright

Guides for Identification of Many Minnesota Wild Plants

Britton, N. L. and A. Brown. 1913. An illustrated flora of the northern United States, Canada, and the British Possessions. 3 vols. New York: Scribner. (Illustrations)

Fernald, M. L. 1950. Gray's manual of botany. 8th ed. New York: The American Book Co.

Monserud, W. and G. B. Ownbey. 1971. Common wild flowers of Minnesota. Minneapolis: Univ. of Minnesota Press. (Illustrations)

Morley, T. 1966. Spring flora of Minnesota. St. Paul: Dept. of Botany, Univ. of Minnesota.

Moyle, J. B. and E. W. Moyle. 1977. Northland wild flowers. Minneapolis: Univ. of Minnesota Press. (Colored photographs)

Peterson, R. T. and M. McKenny. 1968. A field guide to wildflowers of north eastern and north central America. Boston: Mifflen Co. (Colored illustrations)

Rosendahl, C. O. 1928, 1955. Trees and shrubs of the Upper Midwest. Minneapolis: Univ. of Minnesota Press. (Illustrations)

Smith, H. V. 1961. Michigan wildflowers. Cranbrook Institute of Science, Bulletin #42. Bloomfield Hills, Michigan. (Illustrations)

Sources of Information on the Cultivation and Propagation of Native Plants

Aitken, G. D. 1968. Pioneering with wild flowers. New York: Prentiss Hall.

Birdseye, C. and E. G. Birdseye. 1951. Growing woodland plants. London: Oxford Univ. Press. Reprinted in 1972 by Dover Publications, New York.

Curtiss, W. C. 1978. Propagation of wildlfowers. Framingham, Massachusetts: New England Wildflower Society, Inc.

Northington, D. Clearinghouse Information. National Wildflower Research Center. North Austin, Texas.

_____. 1974. Seeds of woody plants in the United States. Agricultural Handbook, No. 450. Forest Service, U.S.D.A.

Rock, H. W. 1971. Prairie propagation handbook. 6th ed., 1981. Milwaukee County Dept. of Parks, Milwaukee, Wisconsin.

Smith, J. R. and B. S. Smith. 1980. The prairie garden. Madison: Univ. of Wisconsin Press.

Smithberg, M. and M. L. Wright. 1976. Growing wildflowers from seed. Amer. Horticulturist 55(6):12-13, 32.

_____ and _____. 1981. Cultivation and germination proceedures for wild flowers. Minn. Horticulturist 109(4):105-108.

Sperka, M. 1973. Growing wildflowers. New York: Harper & Row.

Steffek, E. 1954. Wild flowers and how to grow them. New York: Crown Publishers, Inc. Revised ed. 198

Sullivan, G. A. and R. H. Daley. 1981. Directory to resources on wildflower propagation. Prepared at the Missouri Botanical Garden. National Council of State Garden Clubs. 4401 Magnolia Ave. St. Louis, MO 63110

Wright, M. 1977. Try growing wildflowers. The Minnesota Volunteer 40(231):50-57.

Sources, in the Minnesota and Adjacent Areas, of Wildflower Plants and/or Seeds

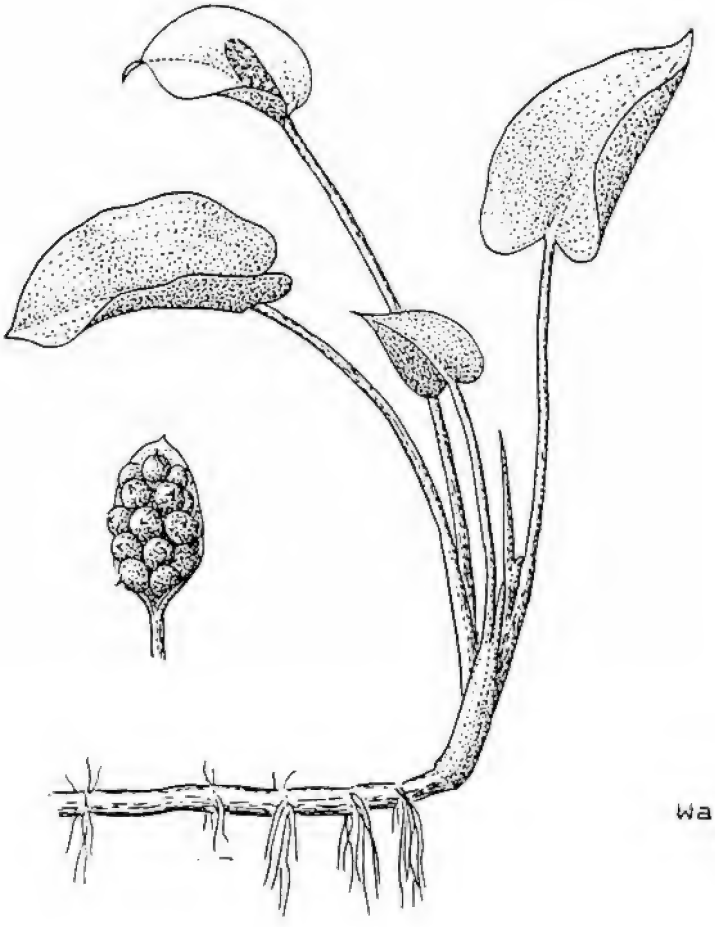
NAME	PLANTS (P) OR SEEDS (S)	ORIGINAL SOURCE OF MATERIAL
American Rock Garden Society 15 Fairmead Rd. Darien, CT 06820 (Seed Exchange)	S	Some from MN
Ferndale Garden Center P.O. Box 218 Askov, MN 55704	P	MN
Landscape Alternatives, Inc. 1465 N. Pascal St. St. Paul, MN 55108	P,S	Many from Twin Cities area
Little Valley Farm R.R.1 Box 287 Richland Center, WI 53581	P,S	Wisconsin
Midwest Wildflowers Box 64 Rockton, IL 61072	S	Illinois
Minn. Native Plant Society 220 Bio. Sci. Center Univ. of Minnesota St. Paul, MN 55108 (Fall Seed Exchange; Spring Plant Sale)	P,S	Many from MN
Orchid Gardens 2232 - 139th Ave. NW Andover, MN 55307	P	MN, especially northern MN
Prairie Moon Nursery Rt.3 Box 163 Winona, MN 55987	P,S	Driftless Area of MN and adjacent areas
Prairie Restoration P.O. Box 327 Princeton, MN 55371	P,S, Seedlings	Most MN
Prairie Ridge Nursery RR.2 9738 Overland Rd Mt. Horeb, WI 53572-2822	P,S	Wisconsin
Prairie Seed Source P.O. Box 83 North Lake, WI 53064-0083	S	Southern Wisconsin

NAME	PLANT (P) OR SEED (S)	ORIGINAL SOURCE OF MATERIAL
Regent Gardens 2460 Regent Ave. N Golden Valley, MN 55422	P	Some MN, Michigan, various
Rice Creek Gardens 1315 66th Ave. NE Minneapolis, MN 55432	P	Some MN, Michigan, various
Univ. of Minnesota Landscape Arboretum 3675 Arboretum Dr. Box 39, Chanhassen, MN 55317 (Spring Plant Sale)	P	Some MN, various

Apologies to May Wright

The Spring 87/88 issue of Minnesota Plant Press carried an article providing some tips for growing native wildflowers. Your editor inadvertently neglected to say that the information was compiled by May Wright and was based on her many years of gardening experiences. My apologies, May, for not giving due credit; an unintentional slip.

--- Nita Cholewa

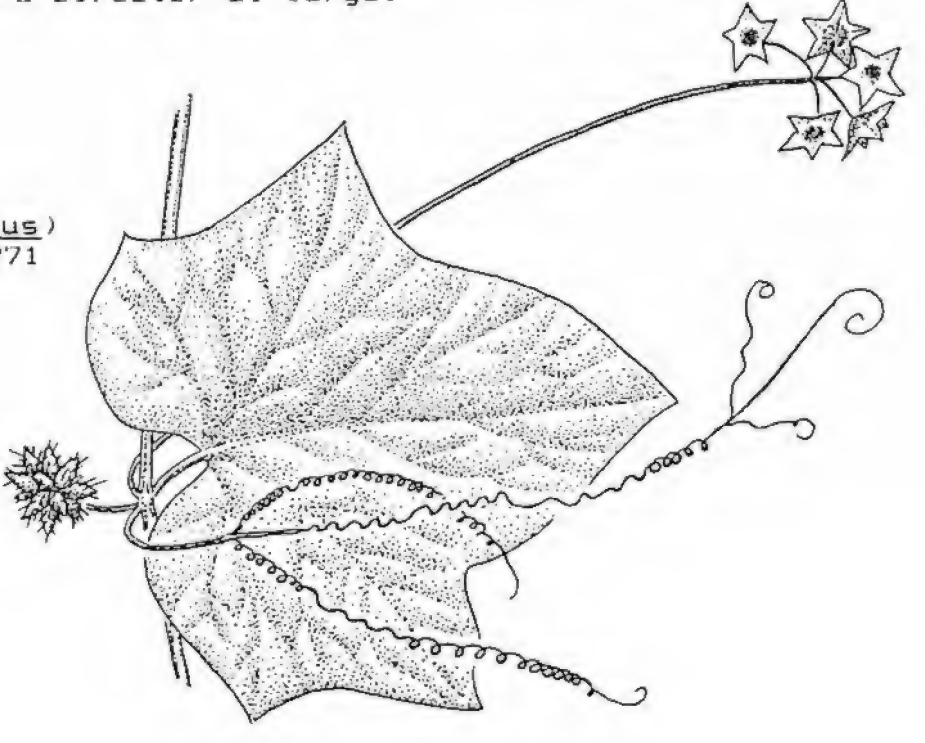


Water arum (Calla palustris)
from Monserud & Dunbey, 1971

OTHER UPCOMING EVENTS ****

September	
8	MN Environmental Congress - Mankato
10-11	UM Landscape Arboretum Flower Show
15	MN Environmental Congress - Alexandria
16-18	Bryological Foray at Black River Falls, Wisconsin. For more information, contact John Christy of the Milwaukee Public Museum.
22	MN Environmental Congress - Duluth
24	UM Landscape Arboretum Fall Festival
October	
3-7	UM-Twin Cities "Just One U" - special all-University week long open house with displays and guest speakers. Call for additional details.
4	Open house at UM Herbarium (8th floor, Bio Sci Center; St. Paul campus) from 2-6 pm.
6	MN Environmental Congress - Bemidji
17-20	Management of Natural Communities - workshop sponsored by the Shawnee NF, US Forest Service Eastern Region, The Nature Conservancy, and Illinois Dept. of Conservation; Paducah, KY. For additional information call Larry Stritch, Illinois Dept. of Conservation at 618-949-3304 or Mike Spanel at 618-253-7114.
20	MN Environmental Congress - St. Paul
22	UM Landscape Arboretum Seminar: Fred Case - Native orchids of Minnesota.

MANY THANKS TO HARRIET MASON, who has served MNPS as President these past two years and who gave so much of her time on behalf of the Society, especially in the matter of the Tonga Lawsuit. Harriet will remain on the Board as a Director-at-large.



Bur cucumber (*Sicyos angulatus*)
from Monserud & Ownbey, 1971

MNPS MEMBERSHIP RENEWALS ARE NOW DUE !

While new members may join at any time, as stated in our bylaws all memberships are to be renewed each fall. To avoid a delinquent membership and missing issues of the newsletter, please have your membership dues **paid by 1 October 1988**. A self-addressed envelope is provided for your convenience with this newsletter. Some people have paid their memberships several years in advance, so please check the mailing label for your membership term.

THIS WILL BE YOUR ONLY RENEWAL NOTICE !

Minnesota Native Plant Society Membership Registration

Make checks payable to: Minnesota Native Plant Society and mail to: Minnesota Native Plant Society, 220 Bio Sci Center, Univ. of Minnesota, St. Paul, MN 55108

____ Renewal ____ New member

Membership categories:

$8.00	____	Individual	$6.00	____	Senior (retired)
$10.00	____	Family	$15.00	____	Institution
$6.00	____	Student	$25.00	____	Donor

Name _____ Phone _____

Address _____

City _____ State _____ Zip _____

U of M campus address _____

As stated earlier in this newsletter, the lawsuit with Tony Tonga has been settled (case dismissed). We must now arrange for payment of the balance of our legal fees, approximately $3000. Please consider making a donation to the lawsuit fund as you renew your membership.

$ _____ donation to lawsuit fund

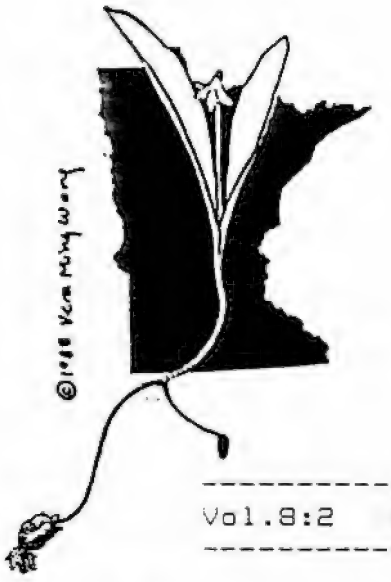
1988/1989 MNPS Board of Directors

David McLaughlin, President (1990)
May Wright, Vice-president (1989)
Welby Smith, Secretary (1989)
Ruth Phipps, Treasurer (1989)
Steve Eggers, Director-at-large (1990)
Robin Fox, Director-at-large (1991)
Harriet Mason, Director-at-large (1990)
John Moriarty, Director-at-large (1991)
Gerald Ownbey, Director-at-large (1991)

Minnesota Plant Press may be obtained through membership in the Minnesota Native Plant Society.

If you have a news item, article, or other information that should be included in the Minnesota Plant Press, please send it to Dr. Anita Cholewa, Dept. of Botany, 220 Bio Sci Center, Univ. of Minnesota, St. Paul, MN 55108. The editor reserves the right to edit all newsletter submissions.

Minnesota Native Plant Society
Dept. of Botany
220 Biological Sciences Center
University of Minnesota
St. Paul, MN 55108

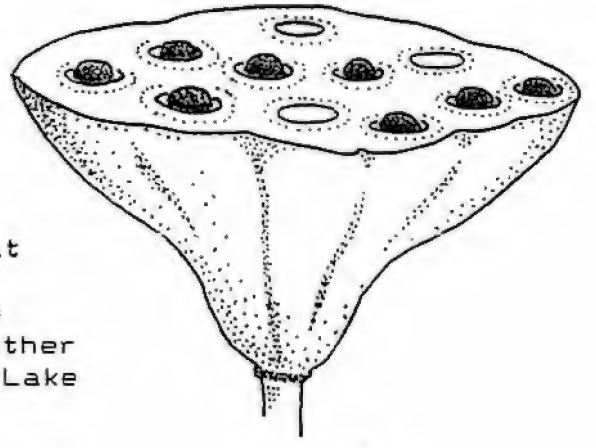


MINNESOTA PLANT PRESS

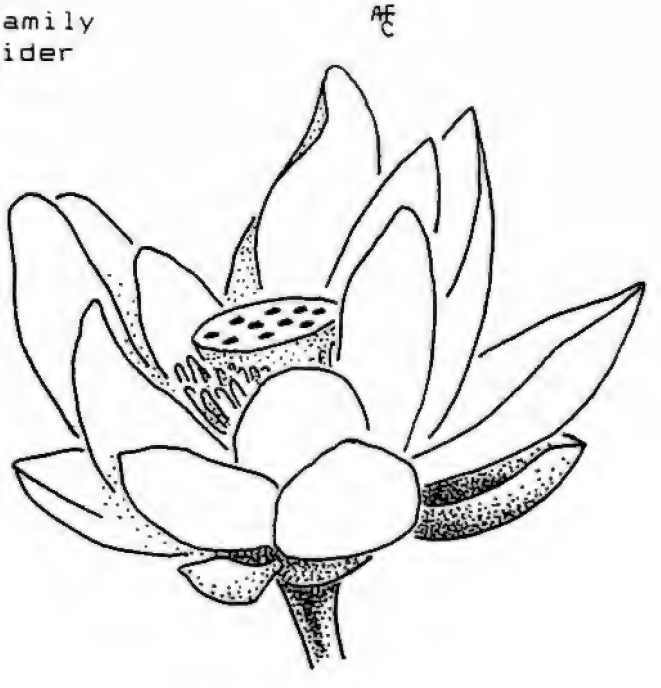
Vol.8:2 NEWSLETTER OF MINNESOTA NATIVE PLANT SOCIETY Winter 88/89

American lotus-lily -- Nelumbo lutea

Of all our native aquatics, the lotus-lily (Nelumbo lutea) is probably best known from dried floral arrangements! Visit any craft shop and you're sure to find the dried (and often painted) remains of the fruits and floral receptacle.



Although not on the state rare plants list, lotus-lily is not very common in Minnesota -- occurring in the lower Minnesota River Valley and thence downstream along the lower Mississippi (and then southward and eastward). It was reported to occur in Lake Minnetonka, but I know of no recent sightings there. Intolerant of boat wakes, the plants are found in quiet bays and backwaters (a rather extensive population occurs on Snelling Lake in Fort Snelling State Park).



Often included in the water-lily family (Nymphaeaceae), many botanists now consider the genus distinct enough to be placed in its own family (Nelumbonaceae). Nelumbo is composed of only two species -- the yellow-flowered American lotus-lily (N. lutea) and the pink-flowered sacred lotus (N. nucifera) of Asia and Australia. The flowers are rather unusual in that the carpels are sunk into the spongy receptacle, which extends beyond the point of attachment of tepals and stamens. Easily recognized from a 65-mph vehicle, the large flowers and leaves are elevated a foot or so above the water surface during late summer.

After pollination (by some sort of beetle) the receptacle, with the developing nuts, expands until nearly as broad as the original flower. The fruits eventually drop out to start the cycle again.

The Asian species is considered quite sacred to Buddhists and its seeds reportedly retain viability for 3000 years, under the proper conditions. The large flowers and subtle fragrance makes the genus a choice ornamental for water gardens and most of the plant (especially the rhizome) is edible. Our Minnesota populations, however, are so few in number that I wouldn't encourage raiding the populations for either use.

---- Nita Cholewa

MNPS NEWS **

Upcoming meetings

General meetings are held the first Wednesday of each month on the **UM St. Paul campus, 335 Borlaug Hall.** Meetings start at **7:30 pm** and are open to the public. Board meetings are held in the St. Paul Student Center Cafeteria, at 6:00 pm, on the same evenings as the general program and are open to all MNPS members.

4 Jan - **Margaret Kohring** (The Nature Conservancy)
"Glacial Relict Plants" -- What do algific, coastal plain, cordilleran, and arctic disjunct plants have in common? They are all affected by glaciers and have fascinating life histories. Hear how these unusual plants are distributed and how they survive in Minnesota.

1 Feb - **Gerald Ownbey** (UM Dept. of Botany - Prof. Emeritis)
"Cultivated Native Trees and Shrubs for the Home"

1 Mar - **Tom Morley** (UM Dept. of Botany - Prof. Emeritis)
"Update on the Minnesota Dwarf Trout Lily"

5 Apr - **Barbara Delaney** (botanist, Cedar Creek NHA)
"Mosses of Minnesota"

3 May - **Audrey Engels** (retired amateur botanist)
"River plants of central Minnesota"
Summer field trip discussion
Annual plant exchange

Carpooling is encouraged. Please consult last year's Directory (issued with Vol.7:3 Supplement) for members near you.

Help Advertise MNPS

MNPS would like to place regular advertisements of its monthly meetings in "Minnesota Monthly" (Minn. Public Radio's monthly magazine). You can help. If you are a member of MPR, please consider contributing your two lines of advertising space per year (all MPR members are allotted two free lines) to our Society by sending your name and MPR membership number to: MNPS, Dept. of Botany, 220 Bio Sci, Univ. of Minn., St. Paul, MN, 55108. Thank you.

1989 MNPS Symposium

Wetland restoration will be the topic of the second annual symposium, tentatively scheduled for Saturday, 1 April 1989. The symposium will include speakers on restoration of marshes, calcareous fens, prairie potholes, and peatlands. A special mailing in late winter will provide further details. Volunteers are needed to help with advance arrangements and to organize registration, demonstrations and refreshments on the day of the event. To volunteer, contact Nancy Sather at
or .

Notice of Board member replacement

Harriet Mason, Director-at-Large and Chairman of the Conservation Legislation Committee, will be leaving in January to spend the next year in Japan. Mary Risdall, long-time member and gardening and conservation enthusiast, has been appointed to replace Harriet as Director until her return.

Nominations for Board of Directors

Elections for new Directors will take place at the March (Annual) Meeting. Directors whose terms expire this summer are Steve Eggers, Welby Smith, and May Wright. The following people have been nominated for the new slate:

Cole Burrell -- Curator of the native plant gardens at the UM Landscape Arboretum, previously of the National Arboretum

Ellen Fuge -- Natural Resource Specialist with the DNR's Natural Heritage Program

Nancy Sather -- Botanist with the DNR's Natural Heritage Program, previously Botanist with The Nature Conservancy; 1989 MNPS Symposium Coordinator

If you do not plan on attending the March meeting, please send in the absentee ballot, located at the end of this newsletter, voicing your opinion.

Donations to the lawsuit fund

This past September/October, we asked you to consider making a donation, along with your membership renewal, to help pay the remaining legal fees. These donations exceeded $800 -- thanks very much to all of you for your support. Special thanks go to Don Lawrence, Harriet Mason, Tom Morley, Nancy Sather and Welby Smith, who made substantial donations.

New members this fall

Please welcome our new members: Judy Biederman (St. Paul); Laura Chandler and Gary Findell (Edina); Chase & Sue Cornelius (Excelsior); Carol J. Dorff (Minneapolis); Linda Fritschel & Jim Kiehne (Minneapolis); Mary Hahn (Sacramento, CA); Bob and Barb Hill (Minnetonka); Alice Johnson and Edgar Paulton (St. Paul); Sally Jorgensen (Minneapolis); Tom Logeland (Burnsville); Mr. & Mrs. Malmquist (Minneapolis); Lowell Newby, Peggy Mathes, and Vicki Lundmark (Richfield); Ray Newman (Grand Rapids); Dennis Nordholm (Minneapolis); Joe O'Brien (UM campus); Anna Pidgeon

(Owatonna); Richard and Jean Porter (St. Paul); Doug Pratt (Scandia); Janice Robidoux (Fridley); Martin Rykel and Kelly Meyer (Roseville); Trudi Schaefer (Hager City, WI); Leona & Jerald Shannon (St. Paul); Sarah Sutcliff (Minneapolis); Ted Tonkinson (Plymouth); Karen Van Norman (St. Paul); Sarah Vest (St. Paul); Elizabeth Walton (Minneapolis); John Wild (Minneapolis); and the Missouri Botanical Garden (St. Louis).

FROM THE UM HERBARIUM ****

Flora of North America

The Missouri Botanical Garden in collaboration with several other institutions recently reinitiated the Flora of North America Project. Vascular plants of the U.S. and Canada (the Mexican flora is too imperfectly known as yet) will be considered in an attempt to provide a comprehensive conspectus and database of the region's flora. The Flora is scheduled to appear in 12 volumes to be published over the next 13 years. A major endeavor but one that will be a major resource on North American plants! The project has received substantial initial monetary support and now has numerous experts who will be contributing treatments for various taxa (including Anita Cholewa - *Sisyrinchium* and Gerald Ownbey - *Argemone*).

Volunteers

A couple of years ago, a volunteer program was initiated in the U of M Herbarium to help with some of the day-to-day activities (such as mounting and filing of specimens) or occasional special projects. If you would like to become a "Friend of the Herbarium" please contact Anita Cholewa if interested in vascular plants; Dave McLaughlin if interested in fungi; Cliff Wetmore if interested in lichens.

Past and present volunteers who deserve a big thanks for their time are Ron Bendixen, Ellen Fuge, Mike Heinz, Charlotte Menzel, Mary Risdall, Jean Stevens, Carol Stoops, and May Wright.

---- Nita Cholewa

NATIVE PLANT NOTES ****

Leland Hughes, of Warroad, reports that eelgrass (*Valisneria americana*) was more prolific than usual this past year in Lake of the Woods. He also noted that, in spite of the drought, there were many boreal forest orchids blooming.

The drought also made it easier to see some of the more uncommon bog and aquatic plants. Audrey Engels and I found the sundew *Drosera intermedia*, white beak-rush *Rhynchospora alba*, slender liverwort *Riccia fluitans*, floating bur-reed *Sparganium fluctuans*, and the bladderwort *Utricularia gibba* at Savanna Portage State Park.

---- Nita Cholewa

THE DRIFTLESS AREA OF MINNESOTA ****

Travelling through the region of southeastern Minnesota known as the "Driftless Area," one observes readily that the lay of the land here is different from much of the state. It has a different feel with its prominent bluffs, meandering streams and steep-sided river valleys that give way to large expanses of flat farmland to the west.

What makes this area so different? The answer lies in its geological history. Millions of years ago, much of the region that is now Minnesota was covered by a warm inland sea. When the sea retreated, it left behind a very thick layer of sediment, which over time became dolomitic limestone. Much later, over 10,000 years ago, the last lobes of the continental ice sheets retreated to the north. As they melted, they dropped their load of glacial drift, the collection of soil, sand and rock the glaciers had carried southward. This covered the limestone and left large regions of rolling hills. Although there had been several glacial advancements, none had ever crossed over the southeastern corner of Minnesota. This is evidenced by the absence of glacial drift deposits, the sculpted topography, and the presence of the ancient limestone immediately beneath the soil and in cliff outcroppings. Adjoining sections of southwestern Wisconsin, northern Illinois and Iowa also share this geological background.

The varied topography and limestone parent material of the soil have created unique plant habitats that are not found in other parts of the state. Lack of glaciation has allowed the continued presence of species that are considered disjuncts, their continuous range of distribution being much farther south and east or, in some cases, farther north or west.

A mixed oak woods occupies dry ridge tops and steep sloping valleys that face north and east in the area. Pignut and shellbark hickories (*Carya cordiformis*, *C. ovata*), plums and cherries (*Prunus* spp.), birches (*Betula* spp.), butternut and black walnut (*Juglans cinerea*, *J. nigra*), and hawthornes (*Crataegus* spp.) are also found here. On steeper slopes that face south or west, "bluff" or "goat prairies" can be found. The prairies' thin soils and dry conditions support xeric prairie grasses and other plants. Wild indigo (*Baptisia bracteata* var. *glabrescens*), narrow-leaved milkweed (*Asclepias stenophylla*), Illinois tick-trefoil (*Desmodium illinoense*), valerian (*Valeriana edulis* ssp. *ciliata*) and white lady's slipper (*Cypripedium candidum*) are some of the unusual species found here.

At the foot of slopes and in valley bottoms where the soil is deeper and water more available, a recovering maple-basswood forest is present. Here witch hazel (*Hamamelis virginiana*), golden seal (*Hydrastis canadensis*), squirrel-corn (*Dicentra canadensis*), black snake root (*Sanicula trifoliata*), and Short's aster (*Aster shortii*) are plants of special interest, as their occurence in this area represents the north and west extremes of

their ranges.

North- and east-facing limestone and sandstone outcroppings form cliffs that are shady and constantly moist, due to seeping water. This precarious habitat is home to such disjuncts and relicts as montia (Montia chamissoi), jewelled shooting star (Dodecatheon amethystinum), and reniform sullivantia (Sullivantia renifolia). Cold air flowing from caves and fissures at the bottom of steep north-facing limestone bluffs creates a habitat that supports other unusual plants. Among the species found in these cold air drainages are moschatel (Adoxa moschatellina), golden saxifrage (Chrysoplenium iowense) and Wolf's junegrass (Poa wolfii).

Many of the rivers in the region are subject to periodic flooding and subsequently support flood-tolerant species of trees and ground flora. Glade mallow (Napaea dioica), snowy campion (Silene nivea), three-lobed coneflower (Rudbeckia triloba), and button bush (Cephalanthus occidentalis) are examples.

This collection of unusual plants makes the Driftless Area a botanical "hot spot," an area well worth visiting. Be cautious, however, as many of the plants that occur in the Driftless Area are included on the state list of rare species, with classifications ranging from special concern to endangered.

For further reading:

Coffin, B. & L. Pfannmuller, eds. 1988. Minnesota's endangered flora and fauna. Minneapolis: Univ. of Minnesota Press, 473pp.

Curtis, J. T. 1959. The vegetation of Wisconsin. Madison: Univ. of Wisconsin Press, 657pp.

Hartley, T. G. 1966. The flora of the "Driftless Area." Univ. of Iowa Studies in Nat. Hist. 21(1):1-174.

Ojakangas, R. W. & C. L. Matsch. 1982. Minnesota geology. Minneapolis: Univ. of Minnesota Press, 255pp.

Waters, T. F. 1977. The streams and rivers of Minnesota. Minneapolis: Univ. of Minnesota Press, 373pp.

---- Nancy Kleven

LEGISLATION AND CONSERVATION: THE WILDFLOWER TASK FORCE ****

The Minnesota Roadside Wildflower Task Force was formed in 1987 by Lieutenant Governor Marlene Johnson to develop a wildflower roadside policy that is in Minnesota's best interest, both now and in the future. This was prompted by renewed interest in wildflowers, the interest of MINNESOTA BEAUTIFUL, and by the designation of the Twin Cities as the host for the 1990 Olympic Festival. The Task Force members represented several state agencies, private organizations, and citizens of Minnesota. MNPS was also represented.

The Task Force was called to recommend ways in which the state can preserve existing native wildflower populations, restore native wildflowers where appropriate, and educate the public

about native wildflowers along Minnesota's roadsides.

Discussion on preservation centered on the lack of identification of existing native areas and the fact that of those known to exist many have already disappeared. The following recommendations were made:

1. Complete the survey of native vegetation along state highways and adjacent railroad rights-of-way in 1989. A similar survey should be initiated in 1989 along county and township roads.
2. Designate and sign roadside rights-of-way throughout the state, where highest quality native vegetation is/has been identified, as "Wildflower Routes." These routes should be identified on the state highway map and incorporated into the Office of Tourism's "Mini Tours."
3. Coordinate planning and environmental review efforts between agencies and organizations with similar and compatible interests in right-of-way acquisition and management. This should include incorporating right-of-way vegetation data into MN/DNR's statewide long distance trail plans (an LCMR funded project '89/90).
4. Environmental Impact Statements and Assessments should specifically address significant and/or rare plant communities before highway/railroad/utility construction projects are designed.
5. Develop a policy that allows for an active and timely mechanism to coordinate the review and intervention in railroad abandonment proceedings between MN/DOT, MN/DNR, and others. This review should include assessment for preservation of significant plant communities.
6. Develop right-of-way management policy guidelines and plans in cooperation with highway departments, railroad companies, public utilities, and the DNR's Roadsides for Wildlife Program. Guidelines should include signing to reduce mowing and herbicide spraying, and techniques such as prescribed burns that would enhance native vegetation.

Restoration of native wildflowers also received a good deal of discussion. There is great interest in restoring native plants to areas where they have been eliminated, and many agencies (such as DNR's Section of Wildlife) are planting hundreds of acres to "natives." Many people do not yet understand that a species has many locally adapted, often distinct, varieties and ecotypes. The local variety of species A may or may not be the same genotype as the variety of species A found in another part of its range. The problem is that there is not enough commercially available seed of local varieties for the huge demand; the seed available for purchase is native to Nebraska, South Dakota, or other areas farther away. This introduction of non-native genotypes may eventually dilute our own strains, which are well adapted to the local conditions. The following recommendations were made:

1. Provide funding (i.e., low-interest loans) and technical assistance to Minnesota native seed growers immediately.

2. Establish a public/private sector committee, including the MN Dept. of Agriculture, to define Minnesota wildflower seed certification by 1990.
3. Establish an interagency plant database to inventory, restore and record existing and planted wildflowers.
4. Support a Midwest native plant regional office sponsored by the National Wildflower Research Center and the University of Minnesota.

We all agreed that education is absolutely necessary. The Task Force further recommended:

1. Establish immediately a Wildflower Council, a public/private sector partnership to promote awareness and oversee the work of private and public organizations.
2. Create a wildflower awards program through MINNESOTA BEAUTIFUL to reward public and private accomplishments to begin in 1990.
3. Launch a wildflower awareness campaign based on educational material defined by an interagency effort to begin as soon as possible.

---- Harriet Mason

1989 BELL MUSEUM NATURAL HISTORY CONFERENCE ****

The Bell Museum of Natural History (UM campus, Minneapolis) will be offering a one day Prairie Conference on **Saturday, 4 March 1989** -- "Prairies: From the Past into the Future - Minnesota's View Through the Tall Grass." This is the 3rd annual natural history conference.

The morning session will include talks by drs. Ed Cushing, John Tester and James Macklovic, and Thomas Sullivan. The morning plenary session will deal with the tall grass prairie over its entire range. The afternoon sessions will cover the topics of Prairie Flora and Fauna, Prairie Management, and Human Aspects on the Prairie. These talks will be focused on Minnesota. There will also be a poster session highlighting prairie related projects and organizations in Minnesota. The cost of the conference will be $20.00, which includes a prairie related lunch. Registration materials will be mailed in the near future.

(MNPS will be presenting a display for this Conference. Members interested in helping assemble the display should contact an MNPS Board member [see last page of this newsletter]).

---- John Moriarty

UPCOMING EVENTS ELSEWHERE ****

UM Landscape Arboretum

Numerous events and classes have been scheduled for the upcoming year. A complete calendar may be obtained by calling or writing the Landscape Arboretum, P.O. Box 39, Chanhassen, MN, 55317; 612-443-2460. Some of the classes deal with native plants and

are listed here for your convenience (there is a charge for some of these, please contact the Arboretum for full information):

21 Jan - Plant Families: Understanding Basic Taxonomy, 1-3 pm
15 Mar - Dormant Identification of Shrubs, 1-3 pm
20 & 27 Apr - Spring Woodland Wildflowers, 10-12 am

UM Research Explorations

The UM Continuing Education is again sponsoring this valuable and exciting program. Selected volunteers provide a tax-deductable contribution to the project of their choice and are exposed to the research in a hands-on experience. Some of this year's projects include:

Taking the "Wild" Out of Wild Rice -- August 1989, UM Central Experiment Station, Grand Rapids MN
Manitoba Battles Mistletoe -- September 1989, various locales in Manitoba
How Do Beetles Find Host Plants -- July 1989, Cedar Creek Nat. His. Area, Bethel MN
Archaeological Origin of Wild Rice Harvesting -- June 1989, Itasca State Park

For information on these and other exciting projects, call

MN Nature Photography Club

Upcoming meetings include **13 January**, "Wetland Plants and Plant Communities" by Steve Eggers. Meetings are held in the Central Community Center (Rm 22), Hwy 7 & Wooddale Ave. in St. Louis Park, on the 2nd Monday of every month; meetings start at 7pm.

Society for Ecological Restoration and Management

This recently formed, international society is sponsoring a symposium on restoration in national parks and the evaluation of restored ecological communities, **16-20 January 1989**, in Oakland CA. For information contact the Society's headquarters, 1207 Seminole Hwy, Madison WI 53711, 608-263-7889.

MISCELLANEOUS NOTES ****

Caution Urged Gardeners

In the fall newsletter, May Wright compiled an extensive list of wildflower seed and plant sources. One section of May's list included "original source of material." The importance of this category needs some additional explanation.

Many wide-ranging plant species vary genetically throughout their range (different "genotypes"). The genetic differences may affect flowering times (e.g., plants at the southern end of the range flower earlier than at the northern end of the range), drought tolerance, tolerance of insect attacks or diseases, or other attributes. Over long periods of time these differences

might lead to the formation of new species and it is, therefore, important to attempt to preserve the natural diversity of genotypes.

Some wildflowers available for sale may represent genotypes other than what is found in Minnesota. These "foreign genotypes" may breed with the local genotypes, causing changes, desirable or undesirable, in the original genetic composition of our natives. It is important then, when buying wildflowers to try to use local seed sources but you can not necessarily tell a genotype just by looking at the outward appearance of a plant. This is why we insist on certain locality information when we have our seed and plant exchanges. If plant materials from non-local sources are used, then their origin should be recorded and noted. Caution should also be taken to keep "foreign" plants from escaping from gardens.

[Editor's note: refer to a previous article: "Preservation of genetic purity" by Douglas Wade, in the spring 1984 issue, for further discussion.]

---- John Moriarty

Conservation Organizations

Numerous organizations are strongly committed to conservation of wildflowers as part of our natural heritage. Many of these organizations have newsletters providing various kinds of information. While MNPS receives some of these newsletters and your editor occasionally quotes appropriate articles, it becomes impossible to keep you informed of all their activities. Therefore, the following list was compiled so you could write directly to some of these organizations if you so desired . . .

American Horticultural Society, P.O. Box 0105, Mt. Vernon VA 22121

Center for Plant Conservation, Arnold Arboretum of Harvard University, 125 Arborway, Jamaica Plain MA 02130

Friends of the Wild Flower Garden, Inc., Eloise Butler Garden and Sanctuary, 5113 N. Bryant, Minneapolis MN 55430

National Wildflower Research Center, 2600 FM 973 North, Austin TX 78725

Operation Wildflower, National Council of State Garden Clubs, 4401 Magnolia Ave., St. Louis MO 63110

Plant Conservation Project, Natural Resources Defense Council, 1350 New York Ave NW, Washington, D.C. 20005

Thomas Jefferson Center for Historic Plants, Monticello, P.O. Box 316, Charlottesville VA 22902

Traffic (USA), World Wildlife Fund - US, 1601 Connecticut Ave NW, Washington, D.C. 20009.

Seeds Needed

The Seed Biology Laboratory in Ottawa, Ontario is in need of various kinds of seed for use in education and research by numerous people. If you would like to make a seed donation, please contact Nita Cholewa . The following seeds

are needed:

Cerastium vulgatum -- mouse-ear chickweed
Glechoma hederacea -- ground-ivy
Lappula redowskii -- western bluebur; stickseed
Malva neglecta -- common mallow; cheeses
Sonchus oleraceus -- field sow-thistle
Zygadenus elegans -- white camus; death camus

New Books

"Minnesota's Endangered Flora and Fauna." Barbara Coffin and Lee Pfannmuler, eds. Available from: Univ. of Minnesota Press, 2037 University Ave. SE, Minneapolis MN 55414. Price: $49.50 hardcover; $16.95 softcover.

"Adventures of a 'Wild' Plants Woman." Norma Phillips. Available from: Little Bridge Publications Co., 6700 Splithand Rd., Grand Rapids MN 55744. Price: $12.95 softcover (plus tax and $1.75 shipping).

"Atlas of the Rare Vascular Plants of Ontario," Vol. 4. Available from: Rare and Endangered Plants Project, Botany Division, National Museum of Natural Sciences, P.O. Box 3443, Station D, Ottawa, Ontario K1P 6P4.

NEWSLETTER DEADLINES **

Items for the next newsletter must be received **by 15 March.** Articles, especially comments/observations of Minnesota plants, are welcome from anyone; the editor reserves the right to edit the items for grammar and clarity. Send items to Dr. Anita Cholewa, Dept. of Botany, University of Minnesota, St. Paul, MN 55108

MERRY CHRISTMAS AND HAPPY NEW YEAR

1989 MNPS ABSENTEE BALLOT

The following slate has been nominated to replace outgoing members of the MNPS Board of Directors (see earlier in this newsletter for background information on the candidates and a list of outgoing members). Board members serve three-year terms (September 1989 - September 1992).

	Yes	No
Cole Burrell	_____	_____
Ellen Fuge	_____	_____
Nancy Sather	_____	_____
write-in candidate (candidates must have been a paid member for at least one year)	_____	

Absentee ballots are valid only if signed by paid member:

Member's signature _____

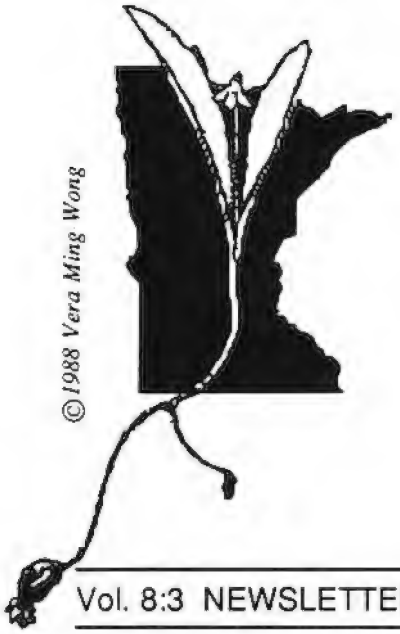
Member's name and address:

1988/1989 MNPS Board of Directors

David McLaughlin, President (1990)
May Wright, Vice-president (1989)
Welby Smith, Secretary (1989)
Ruth Phipps, Treasurer (1989)
Steve Eggers, Director-at-large (1990)
Robin Fox, Director-at-large (1991)
John Moriarty, Director-at-large (1991)
Gerald Ownbey, Director-at-large (1991)
Mary Risdall, temp. Director-at-large (1990)

Minnesota Plant Press may be obtained through membership in the Minnesota Native Plant Society.

Minnesota Native Plant Society
Dept. of Plant Biology
220 Biological Sciences Center
University of Minnesota
St. Paul, MN 55108



MINNESOTA PLANT PRESS

Vol. 8:3 NEWSLETTER OF THE MINNESOTA NATIVE PLANT SOCIETY Spring 1989

Beaked Spike Rush and the Discovery of a Calcareous Fen

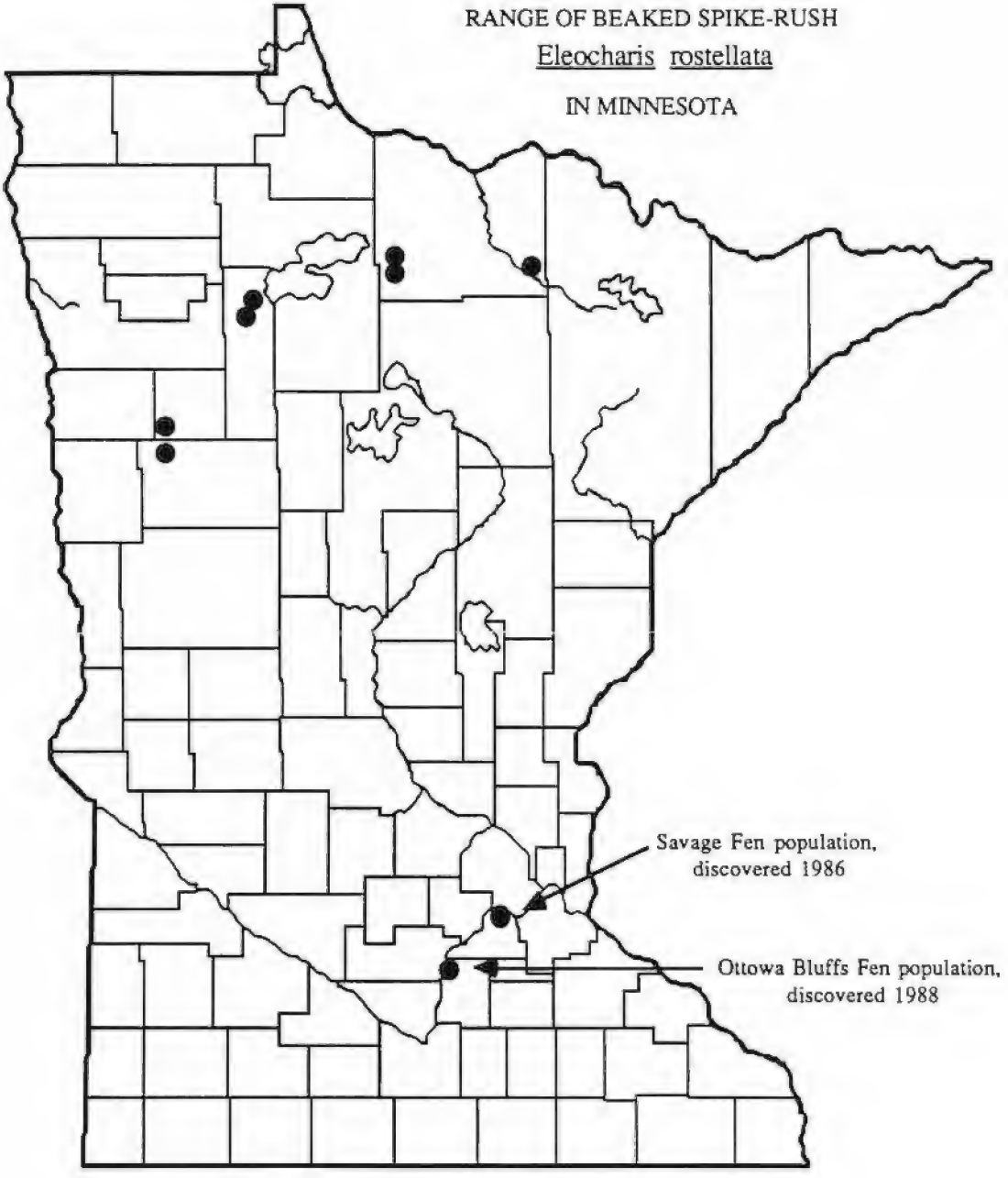
On October 22, 1988, I travelled to the Nature Conservancy's Ottawa Bluffs parcel in Le Sueur County to photograph fall colors. The bluffs overlook the Minnesota River valley and an extensive wetland complex. It was from the vantage point of the bluff that I recognized a "peat dome" in the Fort Snelling State Park Fen, also in the lower Minnesota River valley. I knew that such peat domes are ideal locations for Minnesota's rarest wetland plant community, the calcareous fen.

True to the creed of wetland ecologists ("Have Marsh Will Slog"), I quickly left the uplands behind and proceeded to go "marsh mucking." Even though the dome was the highest elevation within the wetland complex, it was one of the wettest areas due to the emergence of numerous springs and seepages. It is believed the peat domes are caused by the vertical upwelling of groundwater, and I estimated that this particular dome was about 5 to 8 acres in size. A solid stand of hardstem bulrush (Scirpus acutus) was encountered at first, but it then "opened up" into a meadow-like area dominated by calciphiles characteristic of the calcareous fen community described by John Curtis in The Vegetation of Wisconsin.

Lesser fringed gentians (Gentianopsis procera) were still in bloom, and I observed brook lobelia (Lobelia kalmii), Riddell's goldenrod (Solidago riddellii), grass-of-parnassus (Parnassia glauca), swamp lousewort (Pedicularis lanceolata) and fen muhly grass (Muhlenbergia glomerata). In addition, I believe both species of bog arrow-grass (Triglochin maritimum and T. palustre) were present, although this remains to be confirmed because the post-growing season condition of the plants made it difficult to determine. Also to be determined is whether the fine caespitose sedge I observed was sterile sedge (Carex sterilis), an obligate calciphile that is listed as a threatened species in the state. Although not observed, habitat conditions are also excellent for white ladyslippers (Cypripedium candidum), a species of special concern.

But the most exciting find was a rare member of the sedge family that wasn't even known to exist in the state until 1980 (you know you've become a confirmed botany enthusiast when you get excited over sedges). In areas surrounding the spring seeps were plants with long, arching stems that root at the tip - this is beaked spike rush (Eleocharis rostellata), a species listed as threatened in the state. It was especially conspicuous because the stems turn light orange in autumn. Although beaked spike rush is primarily associated with salt marshes along the Atlantic coast, it finds a niche in midwestern calcareous fens because of alkaline peat, rich in calcium and magnesium salts.

This is the second disjunct population of beaked spike rush discovered in Minnesota River valley calcareous fens (see range map*). The discovery of the Savage Fen population was reported in a previous issue of the Minnesota Plant Press. The other 6 populations were discovered in the northcentral and northwestern part of the state, about 200 miles disjunct from Minnesota River populations.



*From Ownbey & Morley, "Checklist and Atlas of the Vascular Plants of Minnesota," in press.

I checked with Welby Smith of the Natural Heritage Program to confirm if this calcareous fen plant community had been reported before, or if it was an addition to the 21 calcareous fen plant communities known in the state (totaling less than 750 acres). Welby stated this was a new find. He said that he had discovered the St. Peter's Fen in this same wetland complex, but about a mile and a half to the south of the fen community I found. The wetland complex that includes these two fen communities extends for about 3 miles along the base of the bluffs

and possesses high potential for supporting other fen communities. Welby and I plan to inventory the Ottawa Bluffs Fen, and the wetlands complex in general, this coming growing season.

Once the additional inventory work has been done, it will be interesting to compare and contrast the Ottawa Bluffs Fen with the other Minnesota River valley fens. One difference already noticed is that it lacks shrubby cinquefoil (Potentilla fruticosa), which is present in Savage Fen (even dominant in some parts) and Black Dog Fen (Scott and Dakota counties, respectfully).

I can't help but wonder how many botany enthusiasts have visited the TNC's Ottawa Bluffs parcel and unknowingly walked by all the rare plants and showy wildflowers supported by the fen at the base of the bluff. If only they had rolled up their pant legs and gone marsh mucking...

---- Steve Eggers

MNPS NEWS ****

Upcoming Meetings

General meetings are held the first Wednesday of each month on the **UM St. Paul campus, 335 Borlaug Hall**. Meetings start at **7:30 pm** and are open to the public. Board meetings are held in the St. Paul Student Center Cafeteria, at 6:00 pm, on the same evenings as the general program and are open to all MNPS members.

3 May - Agenda

- Speaker: **Audrey Engels** (retired botanist), "Riverbank plants of central Minnesota"
- Summer campout discussion
- Summer field trips discussion
- Annual plant exchange

Carpooling is encouraged. Please consult the Directory included with this issue for members near you.

PLEASE NOTE: This will be our last meeting for the year (the new year starts 4 October 1989).

Native Transplant and Seedling Sale

The annual sale of wildflower garden-transplants and seedlings will be held at the May 3 meeting. The sale is a fundraiser with a suggested donation of $ 1.00/plant purchased. One of the goals of the MNPS is to promote the conservation of native plants. Enjoy gardening with native wildflowers without disturbing wild populations -- create gardens with plants started from seed or with transplants from other gardens.

Please help make this project a success by donating (and purchasing) native plants started from seed and native wildflower transplants from member's gardens. **DO NOT COLLECT WILD PLANTS FOR THIS SALE.** Plants should be labeled with the name of the plant (include scientific name if possible) and the name of the donor. Please divide transplants and place in individual pots. Come early to drop-off your plants; this will give us time to organize them. The sale will begin after Audrey Engel's presentation and the discussion of summer activities. Those who have donated plants will have the first opportunity to make three selections. The sale will then be opened to all. You do not have to donate plants to participate in the sale.

---- Chris Soutter

Election Results

The slate of nominees to the Board of Directors was approved by acclamation at the March Annual Meeting. The new board members are Cole Burrell, Ellen Fuge, and Nancy Sather. Their terms begin September 1989 and expire September 1992. Congratulations, and thanks for the willingness to serve.

Erratum

In the winter newsletter (Vol. 8:2) it was incorrectly stated that Steve Egger's term as Director would expire this summer. Instead, Ruth Phipps is leaving the Board. Steve remains for another year.

Special Thanks

A big "thank you" to all who helped make this year's symposium a rousing success. Special gratitude goes to Nancy Sather and Ellen Fuge for coordinating the symposium.
Thanks also go to those who helped create the "What Is A Native Plant" display used at the Bell Museum's Prairie Conference: Nancy Albrecht, Anita Cholewa, Bob Jacobson, Rose Meier, and Dwayne Stenlund.
Thanks also to Doug Pratt for the use of his laser printer.

New Members This Winter

Please welcome our new members: John C. Anderson (Bloomington), Julie Barrett (Wayzata), Char Benson (Northfield), Peg Birse (St. Paul), Bill Bleckwenn (St. Paul), Sidney Burtlow (Minnetonka), Mariette Cole (Bloomington), Cecelia Cope (Bloomington), Kriste Ericsson (Minneapolis), Michael Ferris & Kathleen Shea (Northfield), Mary Finn (St. Anthony), Anna Gerenday (Afton), Dan Jordan (Hibbing), Sonja Larson (Lake Shore), Patricia McCusker (St. Paul), Mary McGee (Minneapolis), Joan Miller (St. Paul), Madeline and Clarence Moes (St. Paul), Bill & Cheryl Morrison (Forest Lake), Bill Morrissey (Maplewood), Martha Phillips (Minneapolis), Cathy Schlecher (Circle Pines), Alice Stenlund (Manhatten Beach), Daniel & Mary Jo Truchon (Blaine), Ernest Tursick (St. Louis Park), Karen Wargo (St. Paul), and Elaine Yorkgitis (St. Paul).

President's Report

This has been an exciting year for those of us interested in the native plants of Minnesota. The Lieutenant Governor's Wildflower Task Force has recommended the development of our roadsides with native flowers and the formation of a Wildflower Council to serve as a resource in promoting Minnesota flora. The MNPS is expected to have a voice on the proposed council.

Planning is underway to develop a Midwest Native Plant Center, which will be affiliated with the National Wildflower Research Center in Austin, Texas and the University of Minnesota Landscape Arboretum. The Midwest Center has as its goal the promotion of research on the preservation and propagation of native plants. It is anticipated that the Wildflower Council will become affiliated with the Midwest Center.

There is also continuing interest in the "Reinvest in Minnesota" (RIM) program, to return marginal lands to native plants and communities. However, there is growing concern that ways be developed to provide truly native seed, ie., from local populations, for these plantings.

Your Society has become increasingly aware that the public often does not know what is meant by a native plant. Our knowledge of the variation within plants is often so limited that it is important to use very local sources of seed to preserve the integrity of local populations. The Society has prepared a new display on "What is a Native Plant" to bring this message to the public. If you would like a copy of the text of the display or would like to use the display at a meeting, please let us know.

Threats to Minnesota's flora continue, as those of us in the Metro area have seen reports of the invasion of several lakes by the Eurasian watermilfoil (Myriophyllum spicatum). However, it is not widely known that there are five native watermilfoils, which are hard to distinguish from the invasive Eurasian watermilfoil [editor's note: see article later this newsletter].

The increasing activity of the Society is a result of the greater involvement of it's members during the past year. We are greatly indebted to the many members who have helped with the Wetland Restoration Symposium, the new display, and in innumerable other ways. We are also greatly indebted to our monthly speakers who have volunteered their expertise, time, and enthusiasm.

To become really effective as an organization that represents th entire state we need still more involvement of our members. For example, we need a membership chair to lead the annual membership drive. We would like to find members in Greater Minnesota to act as regional coordinators to promote local activities and help plan field trips by the Society to different parts of the state. In time it may be possible to develop regional chapters. If you are interested in acting as a local coordinator, please let us know. We are also interested in hearing from you about the flora as well as plant-oriented activities of Greater Minnesota.

---- David McLaughlin

Treasurer's Report - 1988 Fiscal Year

balance forward, 1 January 1988	2901.69
1988 income*	+ 3195.44
	6097.13
1988 expenses**	- 4330.52
balance as of 31 December 1988	1766.61

* income itemization:

membership & donations	2617.00
88 symposium registrations	395.00
plant sale	65.00
interest	118.44
	3195.44

** expense itemization:

legal fees	2093.00
printing (newsletters & symposium brochures)	743.12
postage (newsletters, monthly meeting notices, symposium brochures)	600.69
88 symposium	369.08
display	414.17
misc. expenses	150.46
	4330.52

---- Ruth Phipps

Reports of Committee Chairs

Education Committee -- The following actions were addressed this past year: 1) answered a request from the librarian of the New England Wildflower Society to send a complete group of our newsletters, "The Minnesota Plant Press;" 2) also a request from the same organization for copies of my publications on wildflower seed germination and culture for their library and listings; 3) received and answered 20 letters asking for information on various topics, such as: Which plants are native to Minnesota," "How to make a prairie," "Where can you obtain native trees and shrubs," "How do you start a wildflower garden," and similar topics. In answering the letters I emphasized the need for using native plants and not including alien species and listed the advantages of using seeds or plants from Minnesota or nearby areas instead of from distant states. Brochures were sent with an invitation to join the society. Evidently our brochure and poster have been drawing attention to our society from all over the state and beyond.

---- May Wright

Conservation and Legislation Committee -- Don Knutson has agreed to be the temporary replacement for Harriet Mason (who is in Japan). Don has a Ph.D. in Plant Pathology/Forestry and has occasionally taught extension plant classes. The following is his report....

The Conservation Committee has registered support for the National Biological Diversity Conservation and Environmental Research bill to be introduced in the U.S. Senate by Sen. Robert W. Kasten, Jr. In the letter sent to Sen. Kasten we pointed out that nearly 10% of Minnesota's wild plants are endangered, threatened, or in the category of "high concern." We urged him as author of the Senate bill: 1) to establish conservation of biological diversity as a goal both in this country and abroad; 2) to require that environmental impact statements include the impact on biodiversity and 3) to establish a coordinated federal program for maintaining and restoring biological diversity within this country.
The Society's input has been requested by State Senator Clarence Purfeerst, Chair of the MN Future Resources Commission, concerning the "issues and needs of Minnesota's environment and natural resources." We plan to list the following as highest priority: 1) need for additional vegetational

surveys, by county, to document accurately all of Minnesota; 2) development of management programs to insure success of all wild species within their native habitat; 3) adequate support for the University of Minnesota resources that support survey and other research efforts, including the herbarium, that are critical to the documentation effort and to long-term management evaluation.

---- Don Knutson

Membership Committee -- A volunteer is needed to chair this important committee. Responsibilities consist of coordinating the following activities: 1) develop a New Membership information card; 2) develop a membership poster (work with artist Vera Wong); 3) work with membership directory person (currently Pat Leacock) to keep records up-to-date; 4) develop membership ads for the "Minnesota Horticulturist" and other related magazines; 5) develop a program for increasing Greater Minnesota membership. Anyone interested in this position should contact Dave McLaughlin, . If you would like to assist the chairperson on any of these projects please call Dave also.

SUMMER FIELD TRIPS ****

2nd Annual Summer Campout

Last year's campout was so successful (see fall newsletter, 8:1) that we've decided to make this an annual event. This year's campout is scheduled for 23-25 June, Friday evening through Sunday. The main field trip will take place on Saturday and will consist of exploring the plant communities of Savanna Portage State Park, in northeastern Aitkin Co.: Upland hardwoods, tamarack bog, marsh and riverine communities. Leaders will be Anita Cholewa and Audrey Engels.

Audrey again opens her farm to participants; huge barn in case of rain and to show slides, plenty of room for tenters, limited hookups for trailers, and outhouses. Arrangements can be made for motelers by calling the Aitkin Chamber of Commerce, . You will be responsible for your own meals (grill available) but plan on lots of commeraderie.

Reservations are required and should be made by 10 June, complete directions will be mailed shortly thereafter. Contact: Anita Cholewa at or Audrey Engels at
There is no fee for camping at the farm, but a park permit will be necessary for the field trip.

Day Trips

The following day trips have been arranged by MNPS for enjoyment and education. Old cloths and sturdy walking shoes are the best attire. Bring a bag lunch. **Reservations are required for all trips. Please call Charlotte Menzel,** , if you plan on attending any of these trips; she will coordinate our day trips and will also help with the carpooling arrangements.

Cedar Creek Natural History Area, Anoka & Isanti counties

Date: Saturday, April 22
Time: 9:30 am to noon
Meeting Place: Cedar Creek NHA laboratory
Leader: Barbara Delaney (botanist, DNR Natural Heritage Program)

This trip will take participants into "The Enchanting World of Mosses." A deciduous swamp and a white-cedar swamp will be visited and their moss inhabitants revealed. This trip is nearly full; only a few "seats" remain.

Queen's Bluff, Winona County

DATE: Saturday, June 3
TIME: 8:00 am to late afternoon/early evening
MEETING PLACE: Biological Sciences Center on the UM St. Paul campus, NW side of building.
LEADER: Dr. Gerald Ownbey (professor emeritus, UM)

Queen's Bluff and flanking stream valleys contain tremendous botanical diversity, including a disjunct northern white-cedar community. This is in the Driftless Area and many unusual plants can be found here (see fall newsletter). This area is 3 hours away so it is very important that you be on time.

University of Minnesota Landscape Arboretum, Hennepin County

DATE: Saturday, July 9

TIME: 10:00 am to early afternoon

MEETING PLACE: Parking lot of the Earle Brown Continuing Education Center on the UM St. Paul campus IF YOU WANT TO CARPOOL, otherwise meet in the lobby of the Snyder Building at the Arboretum (identify yourself as a member of the MNPS at the Arboretum gate and admission will be waived).

LEADER: Dr. Shirley Mah Kooyman (taxonomist at the Arboretum)

The Arboretum is part of the Dept. of Horticultural Science and Landscape Architecture. The 905 acres consist of landscaped gardens, generic collections, and natural areas. The field trip will tour the prairie and study the restoration project and perhaps visit the bog.

Savage Fen, Scott County

DATE: Saturday, September 9

TIME: 10:00 am to 1:00 pm

MEETING PLACE: Parking lot of the Earle Brown Continuing Education Center on the UM St. Paul campus IF YOU WANT TO CARPOOL, otherwise meet at the Maintenance Building parking lot at Savage Fen (take hwy 13 west through Burnsville and Savage. At the stoplight , hwy 13 makes a 90 degree turn to the south towards Prior Lake. Make the turn and follow hwy 13 for 1/2 mile to 128th Street, which will be on the east (left) side. Follow 128th Street for about 1/3 mile, turn south (right) before the deadend, to Bay & Bay Transmission).

LEADER: Steve Eggers (wetland ecologist with the U.S. Army Corps of Engineers)

At the base of 100-foot high bluffs of the Minnesota River Valley lies a 500-acre, sloping peat deposit -- Savage Fen. Cold calcareous groundwater bubbles to the surface creating numerous springs and seepages. Calcium and magnesium salts, dissolved by the passage of the groundwater through dolomite bedrock, precipitate at the surface creating a harsh, alkaline soil. Only a select group of calcium-tolerant plants can survive these conditions - the calcareous fen community, the rarest of Minnesota's wetland types. The field trip will concentrate on a 30-acre parcel recently designated as a Scientific and Natural Area. Five plant species listed as State Threatened and two on the Special Concern list have been documented within this parcel.

Botanically oriented field trips are also being sponsored by other organizations....

The Nature Conservancy (call Julie Muehlberg, for reservations and information):

May 6 -- Prairie Ridges and Meadows, Lac Qui Parle Co.
May 20 -- Uncas Dunes, Sherburne Co.
June 10, 11 -- work days, Bluestem Prairie & Pembina Preserve, Clay Co.
June 24 -- work day, Allison Savanna, Anoka Co.
July 30 -- Battle Point Natural Area, Itasca Co.
August 26 -- Red Rock Prairie & Jeffers Petroglyph Historic Site, Cottonwood Co.
September 3 -- work day, Pankratz Prairie, Polk Co.

Dept. of Natural Resources:

August 19 -- PRAIRIE DAY at Agassiz Dunes (Norman Co.), Lac Qui Parle Wildlife Mgmt Area (Lac Qui Parle Co.), Prairie Bush Clover SNA at Kilen Woods State Park (Jackson Co.), Shooting Star Prairie (Mower Co.), or Afton State Park (Washington Co.). Call 218-739-7576 or 612-297-2357 for reservations and information.

September 30 -- Wild River State Park, Chisago Co. -- Celebrating the 10-yr anniversary of the MN Natural Heritage Program; canoe trip, speakers, entertainment, field trips. Call 612-296-3344 for information.

---- Robin Fox

NATIVE PLANT NOTES ****

Dave McLaughlin and I thought it might be fun, as well as informative, to begin an "earliest sighting diary" for a few of our common wildflowers. Recognizing that different regions of the state experience spring at different times and that spring arrives at different times over the years, I have tried to find the earliest flowering dates (based on specimens at the UM Herbarium) for several different counties ranging south to north. See if you can beat these dates.

In prairies:

Anemone patens (Pulsatilla nuttalliana) ** pasque flower
Houston Co. - 5 April; Anoka Co. - 13 March; Douglas Co. - 16 April; Norman Co. - 27 April; Roseau Co. - 11 April

Cypripedium candidum ** white lady's slipper
Winona Co. - 17 May; Pipestone Co. - 30 May; Norman Co. - 16 May; Marshall Co. - 11 June

In rich hardwood forests:

Arisaema triphyllum ** jack-in-the-pulpit
Houston Co. - 1 May; Carver Co. - 18 April; Norman Co. - 11 May; Kittson Co. - 12 June; St. Louis Co. - 16 May; Cook Co. - 7 June

Asarum canadense ** wild ginger
Le Sueur Co. - 24 April; Ramsey Co. - 8 April; Becker Co. - 15 May; St. Louis Co. - 1 May; Lake of the Woods Co. - 4 June

In bogs:

Arethusa bulbosa ** dragon's mouth
Hennepin Co. - 12 June; Itasca Co. - 29 May; Koochiching Co. - 12 June; St. Louis Co. - 12 June

Calopogon tuberosus (C. pulchellus) ** grass-pink
Anoka Co. - 1 July; Stearns Co. - 20 June; Aitkin Co. - 18 June; Beltrami Co. - 19 June Koochiching Co. - 17 July

---- Anita Cholewa

BOTANICAL EXPLORATION OF MINNESOTA'S PRAIRIES: 1838-39, CARL ANDREAS GEYER ****

In late May, 1838, the members of Joseph Nicollet's mapping expedition ascended the Mississippi River aboard the steamer "Burlington." The party was headed for Fort Snelling, established less than 20 years earlier on a bluff above the confluence of the Mississippi and Minnesota rivers. From the Fort the expedition would set off to explore the prairies and woodlands of present-day southern Minnesota. Among the members of the expeditions was Carl Andreas Geyer (1809-1853), a German botanist who was one of the first to collect extensively in the state.

Nicollet was under orders from the Army Corps of Engineers to map the vast region between the Upper Mississippi and the Missouri River. To achieve his objective, Nicollet explored the Minnesota River from Fort Snelling to Big Stone Lake and the Cottonwood, Des Moines and Blue Earth rivers. He surveyed Pipestone Quarry and the Coteau des Prairie and a region he called the Undine, which included the Cannon River watershed and present-day Waseca, Blue Earth, Martin and Jackson counties. In the great age of exploration, the geographer Alexander von Humboldt of Paris had made it unthinkable to map a region without plotting the distribution of its plants and wildlife; so Nicollet asked Geyer to join him and paid out of his own pocket for the botanist's services.

Geyer had been in the United States only three years before he accompanied Nicollet in 1838. Geyer was born in Dresden, Germany, on November 30, 1809, the son of a market gardener. After some instruction in Latin, Geyer in 1826 entered the garden at Zabelitz as an apprentice. In 1830 he returned to Dresden as an assistant in the Botanical Garden. He left Dresden in February 1835 for the United States to make his name as a botanist discovering the unknown plants of the West.

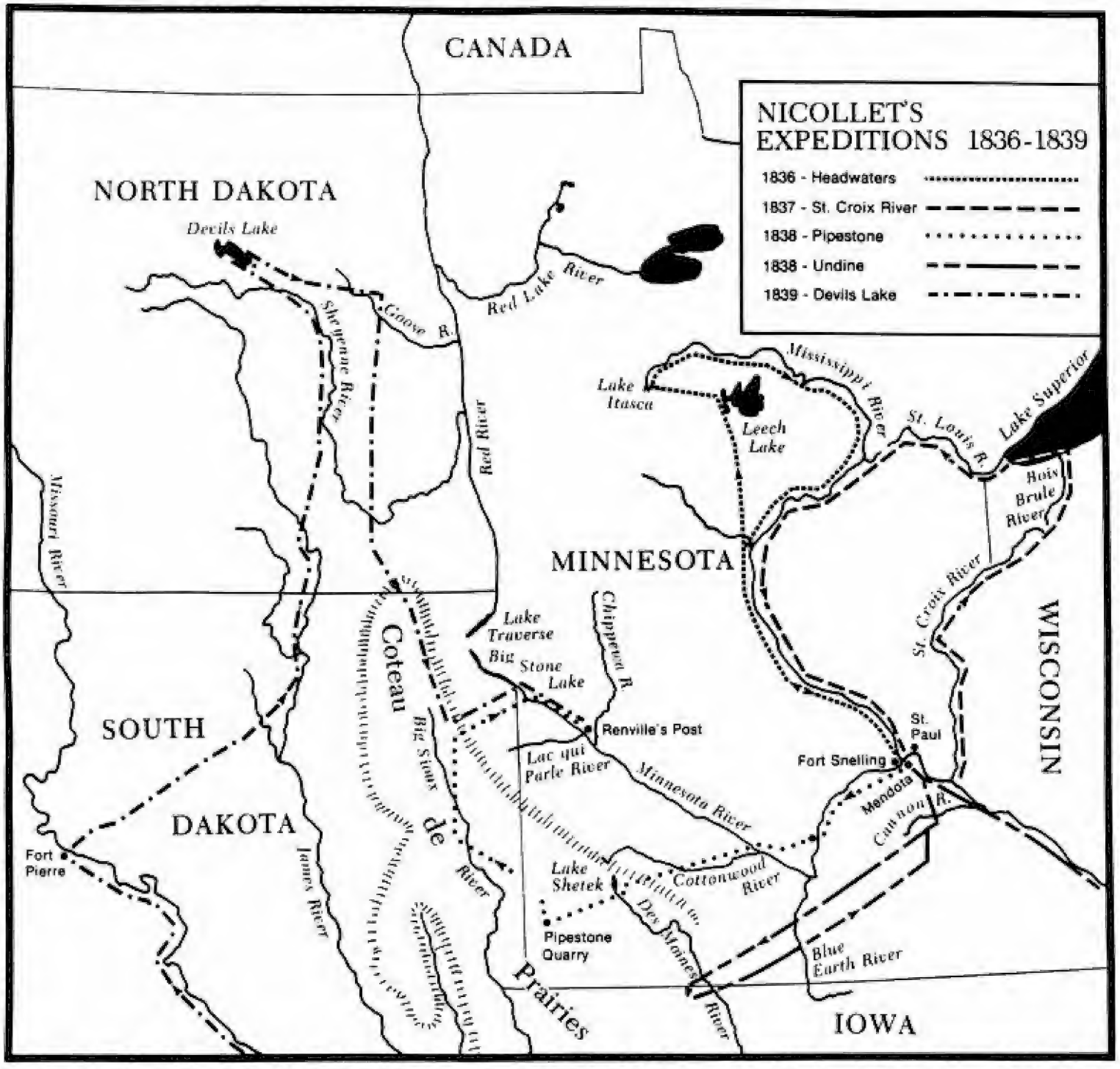
Geyer left New York City and headed straight for St. Louis. Arriving in April, Geyer immediately set off up the Missouri River into the Indian country along the lower Platte River. This hasty botanical tour nearly ended in disaster, for Geyer had difficulty with the Indians and became ill with a fever. But Geyer's fortunes would change. Returning to St. Louis aboard the steamer Diana, Geyer met Nicollet, who also was ill with a fever and had to cut short his work mapping the confluence of the Mississippi and Missouri rivers. Nicollet asked Geyer to join his 1836 expedition to the source of the Mississippi River at Lake Itasca, but Geyer declined, citing his bad experience on the Platte. Upon his return to St. Louis, Geyer became a printer to support himself and learn the English language. In March 1838, Nicollet sent Geyer a letter asking him to accompany him on his expedition to the Coteau des Prairie, and this time Geyer accepted. Geyer considered himself in the employ of Nicollet from 1838-1840.

In 1841 and '42, Geyer collected plants in Iowa, Illinois and Missouri for the prominent botanist George Engelmann of St. Louis. The next year Geyer embarked on the collecting tour for which he is best known. He accompanied the Scottish adventurer and explorer Sir William Drummond Stewart across Missouri, Nebraska and the mountains of Wyoming. Geyer then left the group and headed west to northern Idaho and eastern Washington State, where, in 1844, he made several botanical excursions. He descended the Columbia River to Fort Vancouver and in 1845 returned to Europe via the Hawaiian Islands. He gave his specimens, about 10,000 plants, to Sir William J. Hooker (at the Royal Botanical Gardens in Kew), who published a list of them in his Journal of Botany. No less than 13 North American plants have been named for Geyer, among them Allium geyeri, Aster geyeri, Astragalus geyeri, Carex geyeri, Coggswellia geyeri, Delphinium geyeri and Euphorbia geyeri. By fall of 1845 Geyer had bought some land in Meissen, Germany, and begun a nursery. He married in 1846, and during the last years of his life he edited Die Chronik des Gartenwesens, a horticultural journal. He died November 21, 1853.

The devotion that Geyer showed collecting in the western United States, he also displayed in his work in Minnesota. By the end of October, 1838, he had collected more than 450 plants, most from Minnesota. Geyer was the fourth botanist to enter the state to collect plants, the others being David Bates Douglas in 1820, Thomas Say in 1823, and Douglass Houghton in 1832. Geyer's collection would have been the most outstanding before Minnesota Territory opened for white settlement in 1851 had the collection not been lost while being shipped by steamboat from Fort Snelling to St. Louis. The tragic loss occurred before the boat reached St. Louis, somewhere downstream from the Des Moines or Lower Rapids of the Mississippi near Warsaw, Illinois. Geyer also collected in the state in 1839 as he and Nicollet returned in the fall from a trip up the Missouri River and overland north to Devil's Lake in North Dakota. The plants that survived the 1838 expedition and those of the 1839 tour Geyer sent to John Torrey, of the New York Botanical Garden for identification. Torrey included a list of Geyer's plants in Nicollet's "Report Intended to Illustrate a Map of the Hydrographical Basin of the Upper Mississippi," published in 1845. Seventy-seven of the plants Geyer collected in Minnesota in 1838-39 reached Torrey, but Torrey's list does not provide the year of collection. Fortunately, Geyer faithfully kept a field record of his work in 1838, a small notebook with 143 inscribed pages. The journal and Torrey's list give a reasonably complete picture of Geyer's botanizing in Minnesota.

The region Geyer explored in the state was chiefly prairie, with islands of woods that Nicollet called oases. Perhaps the biggest oasis was the Big Woods, a hardwood forest of oaks, sugar maple and basswood, which Geyer encountered in present-day Scott, Le Sueur, Rice and Blue Earth counties. Along the rivers were gallery forests of cottonwoods, elms and green ash.

Most of Geyer's records of the more common species reinforce our understanding of how they were distributed in the state. For example, from the prairies of southeastern Minnesota west to the Des Moines River, Geyer notes rattlesnake master (Eryginium yuccifolium), compass plant (Silphium laciniatum), yellow gentian (Gentiana flavida), and cream wild indigo (Baptisia leucophaea), among others. On the Coteau occurred purple coneflower (Echinacea angustifolia), downy paintbrush (Castilleja sessiliflora), stiff flax (Linum rigidum), silvery-leaved scurf pea (Psoralea argophylla), scarlet gaura (Gaura coccinea). ascending milk vetch (Astragalus adsurgens), plains evening-primrose (Calylophus serrulatus), white penstemon (Penstemon albidus) and skeleton weed (Lygodesmia juncea). From the Big Woods Geyer collects showy orchis (Galearis spectabilis), ginseng (Panax quinquefolium), wild sarsaparilla (Aralia nudicaulis) and zigzag goldenrod (Solidago flexicaulis). White lady's slipper (Cypripedium candidum) is noted throughout the region's prairies.



Drawn by Alan Ominsky, Minneapolis, MN

from: M. C. Bray. 1980. "Joseph Nicollet and His Map." Philadelphia, Amer. Philosophical Society.

Geyer's journal and letters indicate that he may have collected several new species in Minnesota, but the only plant Torrey determined to be new from the state was Muhlenbergia ambigua, what botanists today call M. mexicana forma ambigua, an awned form of wirestem satin grass. Torrey called the plant a "remarkable specimen," collected on the stoney banks of Okamen Lake, Sioux Country, September 20. Geyer's journal shows that he visited Okamen Lake, today known as Lake Elysian, Waseca County, on September 20, 1838. He says the lake is well-timbered with some of the "largest-size trees," including sugar maple, red oak, butternut (Juglans cinerea), black walnut and american elm. On his approach to the lake from the north Geyer notes a "marshy area" with bog bean (Menyanthes trifoliata) and bladderworts (Utricularia spp.). His journal suggests the new satin grass might have been from the marshy area. Geyer lists only one unidentified grass from the region. It is from the marsh, and the entry is starred, perhaps to show its importance.

To the west of Lake Elysian, in the basin of Blue Earth River, Geyer records Gerardia auriculata, the eared gerardia, today called Agalinis auriculata. Geyer collected this distinctive species, which has not been seen in the county since 1960, on August 16, 1838, while travelling overland on the prairie between a camp near present-day Vernon Center and the junction of the Watonwan and Blue Earth rivers. He says he saw the gerardia in "high grasses, borders of woods, foot of bluffs and bottom bushes". Associates included compass plant (S. laciniatum), indian grass (Cacalia spp.) and rattlesnake master (E. yuccifolium).

Geyer may have been the first to record Coryphantha vivipara, the pincushion cactus, from the granite outcrops south of Big Stone Lake. On July 22, 1838, Geyer camped on the "granite masses" south of the lake near present-day Ortonville. He says he climbed the rocks to search for plants in the cracks and on "accumulated thin soil." In this habitat he finds purple prairie clover (Dalea purpurea), common polypody (Polypodium virginianum), whorled milkwort (Polygala verticillata), and a curious entry for another milkwort, P. purpurea, synonymous with P. sanguinea. Blood milkwort would be far from its range in the eastern part of the state. As he heads to the west side of the outcrop, Geyer finds the pincushion cactus, what he called Mammillaria rubra, in "great perfection in flower and ripe seed" with sleepy catchfly (Silene antirhinna), sand clubmoss (Selaginella rupestris), long-leaved bluets (Houstonia longifolia), prickly pear (Opuntia spp.), cinquefoil (Potentilla pensylvanica) and prairie cinquefoil (P. arguta).

Geyer's records abound with references to many interesting plants, and a few are included here. From the bluffs along the Minnesota River in present-day Scott, Carver and Le Sueur counties, grew a wooly-seeded milkvetch that Geyer called Astragalus eriocarpus. This plant probably is A. lotiflorus, the lotus milkvetch, which today still occurs on a bluff in Le Sueur County, disjunct from the species' main range in western Minnesota. From Louisville Swamp, now part of Carver Rapids State Wayside, tamaracks (Larix larcina) appeared in "high and deep swamps." Geyer also notes that tamaracks were "abundant at lakes Calhoun and Harriet near St. Peter's (Mendota)." From Castle Rock in Dakota County and Carver's Fortifications near Kellogg, Wabasha County, grew false heather (Hudsonia tomentosa) and silky prairie clover (Dalea villosa), which today are still characteristic plants on the regions' sandy soils. From Lac Qui Parle County, Geyer lists soft goldenrod (Solidago mollis) and cutleaf ironplant (Haploppapus spinulosus), which reach the eastern edge of their range in Minnesota. The fringed orchid, Habenaria blephariglottus (probably Platanthera praeclara), grew in wet prairie along the Minnesota River near Beaver Creek in Renville County. From the Cottonwood River between New Ulm and Sleepy Eye, Geyer notes saltwort (Salicornia rubra). The location for saltwort, a western plant of saline lakes and depressions, is unexpected, but salt springs occurred in eastern Minnesota, including on Belle Plaine, Scott County. Geyer makes a most puzzling notation for collection No. 389, an "Asarum-like" plant found on August 18 in Nicollet County across the Minnesota River from present-day Judson. He records the plant from damp prairies with narrow-leaved loosestrife (Lysimachia quadriflora). It is curious entries such as this that leave a sense of regret that most of Geyer's specimens, including this one, were lost.

---- Michael Heinz

ANOTHER EUROPEAN INVASION ****

Some months ago the Star Tribune (26 December, 1988) ran an article on the invasion of some Metro-area lakes by the Eurasian watermilfoil (Myriophyllum spicatum). This plant has the potential to become another purple loosestrife. Not mentioned in the newspaper article, and perhaps not widely known, is the

fact that Minnesota is home to five other species of watermilfoil, all natives. Only two are to be found in Metro-area lakes -- M. verticillatum and M. sibiricum (which used to be called M. exalbescens) -- neither of which is known to be aggressive.

Characters used to distinguish the six species are not overtly obvious to the uninitiated. The following key is adapted from S. Aiken, 1981, "A conspectus of Myriophyllum (Haloragaceae) in North America," Brittonia. 33: 57-69:

1. Leaves scale-like or absent (plants uncommon; Northeastern MN) ..... M. tenellum
1. Leaves pinnately divided.
   2. Flowers and fruits in axils of limp submersed leaves (plants uncommon; Northeastern MN) ..... M. farwellii
   2. Flowers and fruits in erect spikes above the water surface.
      3. Uppermost flowers and all submersed leaves whorled.
         4. Upper bracts (leaf-like structures associated with flowers) with entire margins; lower bracts with entire, serrate, or deeply divided margins; bracts < 2x the length of adjacent flowers.
            5. Stem thickened below the inflorescence, curved to lie parallel with the water surface, branching prolifically at the water surface..... M. spicatum*
            5. Stem not thickened, straight not curved, rarely branching near the water surface (plants common; throughout MN)..... M. sibiricum
         4. Upper bracts with margins deeply divided or dentate; lower bracts with margins deeply divided; bracts > 2x the length of adjacent flowers (plants uncommon; throughout MN)..... M. verticillatum
      3. Uppermost flowers alternate; leaves whorled or alternate (plants uncommon; throughout MN)..... M. alternifolium

Watermilfoils propagate vegetatively quite easily -- this is one reason why Eurasian watermilfoil is becoming a problem. One way to help prevent (or at least slow) the spread of Eurasian watermilfoil is to clean your boats and trailers **before** leaving the lake area and to ask fellow boaters to do the same. Eurasian watermilfoil is known to occur in Lake Minnetonka, (first report for the state, 1987), Libbs Lake, Lake of the Isles, White Bear Lake, and a private lake near Rochester. Please help prevent further spread, check your watercraft!

Additional reading:

Aiken, S.G., R.R. Newroth, and I. Wile. 1979. Biology of Canadian weeds. 34. Myriophyllum spicatum L. Canadian Journal of Weed Science. 59: 201-215.

Aiken, S.G., and R.R. Picard. 1980. The influence of substrate on the growth and morphology of Myriophyllum exalbescens and Myriophyllum spicatum. Canadian Journal of Botany. 58: 1111-1118.

Patten, B.C. 1954. The status of some American species of Myriophyllum as revealed by the discovery of intergrade material between M. exalbescens and M. spicatum in New Jersey. Rhodora. 56: 213-225.

Reed, C.F. 1977. History and distribution of Eurasian watermilfoil in the United States and Canada. Phytologia. 36: 417-436.

---- Anita Cholewa

UPCOMING EVENTS ELSEWHERE ****

DNR Needs Volunteers for Plant Projects

Minnesota Natural Heritage Program botanists are now eagerly planning our field season. Last year the efforts of several informal volunteers who came forward made significant contributions in the discovery and survey of populations of several rare plants. This year we hope to expand and formalize our volunteer program by defraying expenses for short-term volunteers. We also have some funds available to hire field assistants for periods of several days at a time at a rate of $8 to $12 an hour (no benefits) depending on experience and training.

Specific projects for which we are seeking volunteers or short-term employees include:

1. Monitoring of Minnesota dwarf trout lily in Rice and Goodhue counties, late April-early May. Volunteers are needed for a minimum of 4 hour time slots.
2. Survey of known site for western Jacob's ladder in St. Louis County, to determine full size and extent of population, late June or early July. Volunteers are needed for a minimum of one day.
3. Search potential cedar swamp habitat for western Jacob's ladder in St. Louis and Itasca counties, late June or early July. Volunteers are needed for time slots of a minimum of one day.
4. Search potential wet prairie habitat in Polk and Kittson counties for white fringed prairie orchid, 2 weeks in early July. Volunteers are needed for time slots of a minimum of one day.
5. Search potential native prairie habitat in Cottonwood, Jackson, Brown and Redwood counties for prairie bush clover, late July through mid-September. Volunteers are needed for time slots of a minimum of one day.
6. Conduct population counts of prairie bush clover in long-term monitoring plots at Kilen Woods State Park, the last week of August. Volunteers are sought for a minimum of 2 days. Preference will be given to persons available for a full 5 days.

All volunteers will work in the field as part of a team including DNR botanists. Qualifications include an interest in rare plants or native habitats, sharp eyes and the ability to withstand walking and bending over for a full day at a time in outdoor conditions. Formal training in botany is not required. All volunteers will be trained in the field.

Volunteers may be of any age able to do the work (teenage and up) and willing to work at least a four hour day (see specifications for individual projects). We would welcome your participation in our volunteer program or your expression of interest in becoming a short-term employee. For further information call .

---- Nancy Sather

UM Landscape Arboretum

Numerous events and classes have been scheduled for the upcoming seasons. A complete calendar may be obtained by calling or writing the Landscape Arboretum, P.O. Box 39, Chanhassen, MN, 55317; 612-443-2460. Some of the classes deal with native plants and are listed here for your convenience.

20 & 27 April - Spring Woodland Wildflowers
28 April - Minnesota Beautiful Conference
17 June - Exploring Plant Habitats of the Arboretum

Minneapolis Institute of Arts

"Art in Bloom" showing **26-29 April.**

St. Croix Valley Watershed Seminar

An informal seminar on wetland ecology "Saving Our Wetlands: The Threat of Purple Loosestrife and Other Aquatic Exotics," is being sponsored by the Marine-Carnelian Watershed District, the Valley Branch Watershed District, and the Sierra Club's St. Croix Valley Group. The seminar will be held on Tuesday, **June 13**, at the County Commissioners Room in the south wing of the Washington County Government Center in Stillwater, MN. For more information call: John Baird ; Russ Kirby ; or Dale Anderson .

Shiitake Mushrooms: National Symposium and Trade Show

Sponsored by the University of Minnesota, the Forest Resource Center (Lanesboro), the USDA Forest Service, and the National Exotic Mushroom Assoc., this event hopes to: 1) assess the current status of the shiitake industry; 2) share information on production and management; 3) suggest marketing strategies; and 4) identify research needs. The symposium will be held **May 3-5** at the Ramada Hotel, 1870 Old Hudson Rd., St. Paul. For more information call the UM Educational Development System at 1-800-367-5363 or 612-625-2722.

Denali Parks of Alaska

Wasilla Community Schools (Anchorage AK) is offering an opportunity to the study the natural history of Denali Parks (Denali National Park and Denali State Park). Under the guidance of a professional naturalist/wildlife biologist, you will travel by Alaska Railroad and by river rafts on a 12 day expedition, which will emphasize understanding the ecology of the parks' birds, mammals, and flowering plants. Trip dates: **13-23 July** and **17-28 August**. For full information contact John Wenger, 6038 E. 12th, #10, Anchorage, AK 99504.

MISCELLANEOUS NOTES -- BOOK REVIEW ****

Adventures of a 'Wild' Plants Woman, by Norma Phillips --

This is a book mainly about wildflowers, but with a different approach. It is a chronicle of the author's experiences as a plant collector and propagator in connection with the nursery she and her husband conducted for years.

Most of the approximately two hundred species covered are the attractive herbaceous ones that are native to her area of northcentral Minnesota. Since these have wide distribution in northern evergreen forests, northern hardwoods areas and bogs across the country, the book should have wide application. The chapter on ferns also includes the fern allies, which is a rather unique feature. Some shrubs are also dealt with.

Unlike the books that picture and describe the plants in bloom, the author's descriptions are of the plants in their fruiting and dormant stages. This information could be crucial to the successful collecting or moving of plants from a threatened area. It could also be helpful in the recognition of the plants during seed collection. The text is not just a list, but a readable story. However, it will probably be used to a large extent as a reference for its cultural notes on each species.

To keep from depleting the area by continuous collecting, the author did some propagating. Vegetative propagation methods are given in detail, especially for more difficult species. When seed propagation was tried, it was usually done by sprinkling fresh seed around the base of the mother plant. The results therefore could not be very precise. Readers may find that some statements may not be in accord with their own experiences or that given by other authors. One should realize that fresh seeds can differ greatly in their germination from those that have become dormant by drying and storage. Many gardeners to not have access to fresh seed.

An additional feature is the chapter on the building of their nursery business by the author and her husband. This may be of interest to some. Personally, I enjoyed the author's poems sprinkled throughout the book. They show her sensitivity to the natural environment. (Price $12.95. Quality soft cover. Minnesota residents add 6% tax. Postage $1.75. From Little Bridge Publishing Co., 6700 Splithand Rd., Grand Rapids, MN 55744).

---- May Wright

MEET NEW FRIENDS THIS SUMMER -- ATTEND A FIELD TRIP

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220 Biological Sciences Center
University of Minnesota
St. Paul, MN 55108